

DEPARTMENT OF THE INTERIOR

FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

Water-Supply Paper 392

**SURFACE WATER SUPPLY OF THE
UNITED STATES
1914**

PART XII. NORTH PACIFIC DRAINAGE BASINS

**A. PACIFIC DRAINAGE BASINS IN WASHINGTON
AND UPPER COLUMBIA RIVER BASIN**

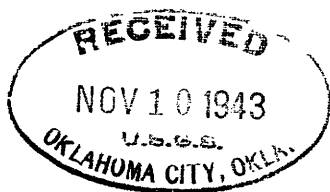
NATHAN C. GROVER, Chief Hydraulic Engineer

G. L. PARKER and W. A. LAMB, District Engineers

Prepared in cooperation with
THE STATES OF WASHINGTON, MONTANA, AND IDAHO



**WASHINGTON
GOVERNMENT PRINTING OFFICE
1916**



ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
30 CENTS PER COPY

CONTENTS.

	Page.
Authorization and scope of work.....	7
Definition of terms.....	8
Convenient equivalents.....	9
Explanation of data.....	11
Accuracy of field data and computed results.....	13
Cooperation.....	14
Division of work.....	15
Gaging-station records.....	15
Quinault River basin.....	15
Quinault River at Quinault, Wash.....	15
Puget Sound drainage basin.....	17
Nisqually River near Ashford, Wash.....	17
Puyallup River near Electron, Wash.....	18
White River at Buckley, Wash.....	20
White River flume at Buckley, Wash.....	22
South Fork of Skykomish River near Index, Wash.....	23
Miller Creek near Berlin, Wash.....	25
North Fork of Skykomish River at Index, Wash.....	26
South Fork of Stilaguamish River near Silverton, Wash.....	28
South Fork of Stilaguamish River at Granite Falls, Wash.....	29
Skagit River at Reflector Bar, near Marblemount, Wash.....	31
Skagit River near Marblemount, Wash.....	33
Skagit River near Sedro Woolley, Wash.....	34
Stetattle Creek near Marblemount, Wash.....	36
Baker Lake near Concrete, Wash.....	37
Baker River below Anderson Creek, near Concrete, Wash.....	38
Baker River at Concrete, Wash.....	40
Whatcom Lake near Bellingham, Wash.....	42
Whatcom Creek near Bellingham, Wash.....	42
Upper Columbia River basin.....	44
Kootenai River at Libby, Mont.....	44
Callahan Creek at Troy, Mont.....	45
Yaak River near Troy, Mont.....	46
Moyie River at Snyder, Idaho.....	47
Clark Fork at St. Regis, Mont.....	49
Clark Fork near Plains, Mont.....	50
Pend Oreille Lake at Sandpoint, Idaho.....	52
Clark Fork at Metaline Falls, Wash.....	53
Racetrack Creek near Anaconda, Mont.....	54
Little Blackfoot River near Elliston, Mont.....	55
West Fork of Bitterroot River near Darby, Mont.....	56
East Fork of Bitterroot River near Darby, Mont.....	57
Lolo Creek near Lolo, Mont.....	59
St. Regis River near St. Regis, Mont.....	60
North Fork of Flathead River near Columbia Falls, Mont.....	62

Gaging-station records—Continued.

Upper Columbia River basin—Continued.

	Page.
Flathead Lake at Polson, Mont.....	63
Flathead River near Polson, Mont.....	64
Middle Fork of Flathead River at Belton, Mont.....	65
Lake McDonald outlet at Lake McDonald, Mont.....	66
South Fork of Flathead River near Columbia Falls, Mont.....	67
Little Bitterroot River near Marion, Mont.....	68
Little Bitterroot River near Hubbard, Mont.....	69
Crow Creek near Ronan, Mont.....	71
Crow Creek at Lozeau's ranch, near Ronan, Mont.....	72
Mission Creek near St. Ignatius, Mont.....	74
Dry Creek near St. Ignatius, Mont.....	76
Post Creek near St. Ignatius, Mont.....	77
South Fork of Jocko River near Jocko, Mont.....	78
Jocko River near Jocko, Mont.....	80
Middle Fork of Jocko River near Jocko, Mont.....	81
North Fork of Jocko River near Jocko, Mont.....	83
Falls Creek near Jocko, Mont.....	84
Big Knife Creek near Jocko, Mont.....	86
Agency Creek near Jocko, Mont.....	87
Finley Creek near Jocko, Mont.....	89
East Finley Creek near Jocko, Mont.....	90
Indian ditch near Jocko, Mont.....	92
Revais Creek near Dixon, Mont.....	94
Thompson River near Thompson Falls, Mont.....	95
Prospect Creek near Thompson Falls, Mont.....	96
Priest River at outlet of Priest Lake, at Coolin, Idaho.....	97
Sullivan Lake near Metaline Falls, Wash.....	99
Sullivan Creek near Metaline Falls, Wash.....	100
Kettle River at Boyds, Wash.....	102
Hall Creek near Inchelium, Wash.....	103
Stranger Creek at Inchelium, Wash.....	105
North Fork of Coeur d'Alene River at Prichard, Idaho.....	106
Coeur d'Alene Lake at Coeur d'Alene, Idaho.....	108
Spokane River at Post Falls, Idaho.....	109
Spokane River at Spokane, Wash.....	110
Spokane River below Little Falls, near Long Lake, Wash.....	112
St. Joe River at Avery, Idaho.....	114
Spokane Valley Land & Water Co.'s canal at Post Falls, Idaho.....	115
Sanpoil River at Keller, Wash.....	117
Nespelem River at Nespelem, Wash.....	118
Okanogan River at Okanogan, Wash.....	119
Similkameen River near Oroville, Wash.....	121
Salmon Creek near Conconully, Wash.....	122
Methow River at Pateros, Wash.....	124
Stehekin River at Stehekin, Wash.....	125
Lake Chelan at Chelan, Wash.....	127
Chelan River at Chelan, Wash.....	128
Entiat River at Entiat, Wash.....	129
Wenatchee River near Leavenworth, Wash.....	131
Wenatchee River at Dryden, Wash.....	133
White River near Chiwaukum, Wash.....	135

Gaging-station records—Continued.

Upper Columbia River basin—Continued.		Page.
Chiwawa Creek near Leavenworth, Wash.....		136
Iceicle Creek near Leavenworth, Wash.....		138
Wenatchee Valley canal at Dryden, Wash.....		139
Moses Lake at Neppel, Wash.....		140
Keechelus Lake near Martin, Wash.....		142
Yakima River near Martin, Wash.....		142
Yakima River at Easton, Wash.....		144
Yakima River at Cle Elum, Wash.....		146
Yakima River at Umtanum, Wash.....		148
Yakima River at Union Gap, near Yakima, Wash.....		150
Yakima River near Wapato, Wash.....		152
Yakima River near Prosser, Wash.....		154
Yakima River at Kiona, Wash.....		156
Kachess Lake near Easton, Wash.....		158
Kachess River near Easton, Wash.....		159
Cle Elum Lake near Roslyn, Wash.....		161
Cle Elum River near Roslyn, Wash.....		161
Teanaway River near Cle Elum, Wash.....		163
Manastash Creek near Ellensburg, Wash.....		164
Naches River at Anderson's ranch, near Nile, Wash.....		166
Naches River at Oak Flat, near Nile, Wash.....		168
Bumping Lake near Nile, Wash.....		170
Bumping River near Nile, Wash.....		170
American River near Nile, Wash.....		172
North Fork of Tieton River below Clear Creek, near Naches, Wash....		173
Tieton River at McAllister Meadows, near Naches, Wash.....		175
Tieton River at headworks of Tieton canal, near Naches, Wash.....		176
Tieton canal near Naches, Wash.....		178
North Fork of Ahtanum Creek near Tampico, Wash.....		179
South Fork of Ahtanum Creek near Tampico, Wash.....		180
New Reservation canal near Parker, Wash.....		182
Old Reservation canal near Parker, Wash.....		184
Sunnyside canal near Wapato, Wash.....		185
Toppenish Creek near Fort Simcoe, Wash.....		187
Simcoe Creek near Fort Simcoe, Wash.....		188
Reservation drain at Alfalfa, Wash.....		190
Satus Creek below Dry Creek, near Toppenish, Wash.....		192
Miscellaneous measurements.....		194
Index.....		197

ILLUSTRATIONS.

PLATE I. A, Price current meter; B, Typical gaging station.....	12
II. Water-stage recorders: A, Stevens; B, Gurley printing; C, Friez.....	13

SURFACE WATER SUPPLY OF PACIFIC DRAINAGE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN, 1914.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1914.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation in the arid West. Since the fiscal year ending June 30, 1895, successive sundry bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods and utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895-1915.

1895.....	\$12, 500
1896.....	20, 000
1897 to 1900, inclusive.....	50, 000
1901 to 1902, inclusive.....	100, 000
1903 to 1906, inclusive.....	200, 000
1907.....	150, 000
1908 to 1910, inclusive.....	100, 000
1911 to 1915, inclusive.....	150, 000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 14.

Measurements of stream flow have been made at about 3,400 points in the United States¹ and also at many points in Alaska and the

¹ Stream-gaging stations and publications relating to water resources, 1885-1913; U. S. Geol. Survey Water-Supply Paper, 340, 1916.

Hawaiian Islands. In July, 1914, 1,480 gaging stations were being maintained by the Survey and the cooperating organizations. Many miscellaneous discharge measurements are made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the “run-off” or “discharge”—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent the rate of flow, as second-feet, gallons per minute, miner’s inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in depth of inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, acre-feet, and millions of cubic feet. They may be defined as follows:

“Second-feet” is an abbreviation for “cubic feet per second.” A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the tables of convenient equivalents (p. 9).

“Second-feet per square mile” is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

“Run-off (depth in inches)” is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth of inches.

An “acre-foot,” equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

“Millions of cubic feet” is applied to quantities of water stored in reservoirs, most frequently in connection with studies of flood control.

The following terms not in common use are here defined:

“Discharge relation,” an abbreviation for the term “relation of gage height to discharge.”

“Control,” “controlling section,” and “point of control,” terms used to designate the section or sections of the stream below the gage which determine the discharge relation at the gage. It should be

noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—to which the surface of the river would fall if there were no flow.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.03719	1.041	1.079	1.116	1.153
2.....	.07438	2.083	2.157	2.231	2.306
3.....	.11157	3.124	3.236	3.347	3.459
4.....	.14876	4.165	4.314	4.463	4.612
5.....	.18595	5.207	5.393	5.578	5.764
6.....	.22314	6.248	6.471	6.694	6.917
7.....	.26033	7.289	7.550	7.810	8.070
8.....	.29752	8.331	8.628	8.926	9.223
9.....	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the run-off for one day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	1.983	55.54	57.52	59.50	61.49
2.....	3.967	111.1	115.0	119.0	123.0
3.....	5.950	166.6	172.6	178.5	184.5
4.....	7.934	222.1	230.1	238.0	246.0
5.....	9.917	277.7	287.6	297.5	307.4
6.....	11.90	333.2	345.1	357.0	368.9
7.....	13.88	388.8	402.6	416.5	430.4
8.....	15.87	444.3	460.2	476.0	491.9
9.....	17.85	499.8	517.7	535.5	553.4

NOTE.—For part of a month multiply run-off for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge in second-feet.	Run-off in millions of cubic feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.0864	2.419	2.506	2.592	2.678
2.....	.1728	4.838	5.012	5.184	5.356
3.....	.2592	7.257	7.518	7.776	8.034
4.....	.3456	9.676	10.02	10.37	10.71
5.....	.4320	12.10	12.53	12.96	13.39
6.....	.5184	14.51	15.04	15.55	16.07
7.....	.6048	16.93	17.54	18.14	18.75
8.....	.6912	19.35	20.05	20.74	21.42
9.....	.7776	21.77	22.55	23.33	24.10

NOTE.—For part of a month multiply the run-off for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of gallons.

Discharge in second-feet.	Run-off in millions of gallons.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.6463	18.10	18.74	19.39	20.04
2.....	1.293	36.20	37.48	38.78	40.08
3.....	1.939	54.30	56.22	58.17	60.12
4.....	2.585	72.40	74.96	77.56	80.16
5.....	3.232	90.50	93.70	96.95	100.2
6.....	3.878	108.6	112.4	116.3	120.2
7.....	4.524	126.7	131.2	135.7	140.3
8.....	5.171	144.8	149.9	155.1	160.3
9.....	5.817	162.9	168.7	174.5	180.4

NOTE.—For part of a month multiply the run-off for one day by the number of days.

Table for converting velocity in feet per second into velocity in miles per hour.

[1 foot per second=0.681818 mile per hour, or two-thirds mile per hour, very nearly; 1 mile per hour=1.4667 feet per second. In computing the table the figures 0.68182 and 1.4667 were used.]

Feet per second (units).	Tenths.									
	0	1	2	3	4	5	6	7	8	9
0.....	0.000	0.068	0.136	0.205	0.273	0.341	0.409	0.477	0.545	0.614
1.....	.682	.750	.818	.886	.955	1.02	1.09	1.16	1.23	1.30
2.....	1.36	1.43	1.50	1.57	1.64	1.70	1.77	1.84	1.91	1.98
3.....	2.05	2.11	2.18	2.25	2.32	2.39	2.45	2.52	2.59	2.66
4.....	2.73	2.80	2.86	2.93	3.00	3.07	3.14	3.20	3.27	3.34
5.....	3.41	3.48	3.55	3.61	3.68	3.75	3.82	3.89	3.95	4.02
6.....	4.09	4.16	4.23	4.30	4.36	4.43	4.50	4.57	4.64	4.70
7.....	4.77	4.84	4.91	4.98	5.05	5.11	5.18	5.25	5.32	5.39
8.....	5.45	5.52	5.59	5.66	5.73	5.80	5.86	5.93	6.00	6.07
9.....	6.14	6.20	6.27	6.34	6.41	6.48	6.55	6.61	6.68	6.75

Table for converting discharge in second-feet into theoretical horsepower per foot of fall.

[1 second-foot=0.1136 theoretical horsepower per foot of fall. Weight of 1 cubic foot of water=62.5 pounds.]

Tens.	Units.									
	0	1	2	3	4	5	6	7	8	9
0.....	0.00	0.114	0.227	0.341	0.454	0.568	0.682	0.795	0.909	1.02
1.....	1.14	1.25	1.36	1.48	1.59	1.70	1.82	1.93	2.04	2.16
2.....	2.27	2.39	2.50	2.61	2.73	2.84	2.95	3.07	3.18	3.29
3.....	3.41	3.52	3.64	3.75	3.86	3.98	4.09	4.20	4.32	4.43
4.....	4.54	4.66	4.77	4.88	5.00	5.11	5.23	5.34	5.45	5.57
5.....	5.68	5.79	5.91	6.02	6.13	6.25	6.36	6.48	6.59	6.70
6.....	6.82	6.93	7.04	7.16	7.27	7.38	7.50	7.61	7.72	7.84
7.....	7.95	8.07	8.18	8.29	8.41	8.52	8.63	8.75	8.86	8.97
8.....	9.09	9.20	9.32	9.43	9.54	9.66	9.77	9.88	10.0	10.1
9.....	10.2	10.3	10.5	10.6	10.7	10.8	10.9	11.0	11.1	11.2

1 second-foot equals 40 California miner's inches (law of Mar. 23, 1901).

1 second-foot equals 38.4 Colorado miner's inches.

1 second-foot equals 40 Arizona miner's inches.

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year (365 days) covers 1 square mile 1.131 feet of 13.572 inches deep.

1 second-foot for one year (365 days) equals 31,536,000 cubic feet.

- 1 second-foot equals about 1 acre-inch per hour.
 1 second-foot for one year (365 days) equals 724 acre-feet.
 1 second-foot for one day equals 86,400 cubic feet.
 1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.
 1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
 1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
 1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
 1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.
 100 California miner's inches equals 18.7 United States gallons per second.
 100 California miner's inches for one day equals 4.96 acre-feet.
 100 Colorado miner's inches equals 2.60 second-feet.
 100 Colorado miner's inches equals 19.5 United States gallons per second.
 100 Colorado miner's inches for one day equals 5.17 acre-feet.
 100 United States gallons per minute equals 0.223 second-foot.
 100 United States gallons per minute for one day equals 0.442 acre-foot.
 1,000,000 United States gallons per day equals 1.55 second-feet.
 1,000,000 United States gallons equals 3.07 acre-feet.
 1,000,000 cubic feet equals 22.95 acre-feet.
 1 acre-foot equals 325,850 gallons.
 1 inch deep on 1 square mile equals 2,323,200 cubic feet.
 1 inch deep on 1 square mile equals 0.0737 second-foot per year.
 1 foot equals 0.3048 meter.
 1 mile equals 1.60935 kilometers.
 1 mile equals 5,280 feet.
 1 acre equals 0.4047 hectare.
 1 acre equals 43,560 square feet.
 1 acre equals 209 feet square, nearly.
 1 square mile equals 2.59 square kilometers.
 1 cubic foot equals 0.0283 cubic meter.
 1 cubic foot of water weighs 62.5 pounds.
 1 cubic meter per minute equals 0.5886 second-foot.
 1 horsepower equals 550 foot-pounds per second.
 1 horsepower equals 76.0 kilogram-meters per second.
 1 horsepower equals 746 watts.
 1 horsepower equals 1 second-foot falling 8.80 feet.
 $1\frac{1}{2}$ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Second-feet} \times \text{fall in feet}}{11} = \text{net horsepower on}$
 water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

The data presented in this report cover the year beginning October 1, 1913, and ending September 30, 1914. At the first of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water, in the form of snow or ice, or in ponds, lakes, and swamps, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for

the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations (Pl. I, *B*) consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff gage or from a water-stage recorder (Pl. II) that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge.

From the discharge measurements rating tables are prepared that give the discharge for any stage, and these rating tables, when applied to the gage heights, give the daily discharge from which the monthly and yearly mean discharge is determined.

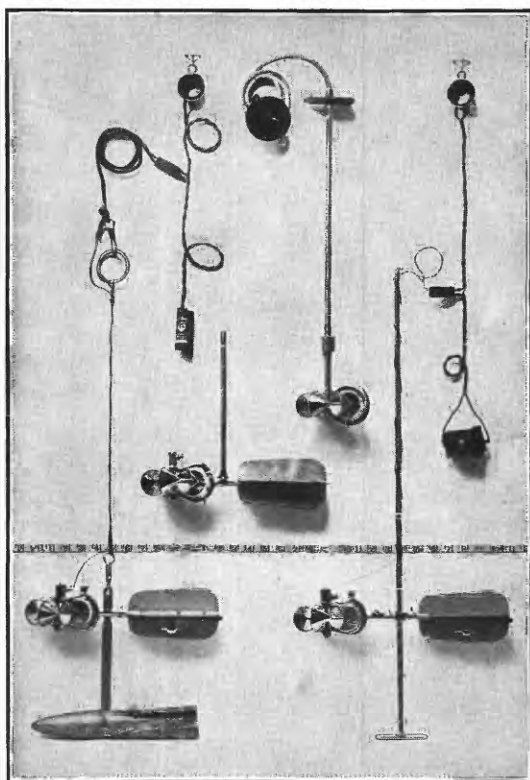
The data presented for each gaging station in the area covered by this report comprises a description of the station, a table giving results of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage heights and results of discharge measurements are published.

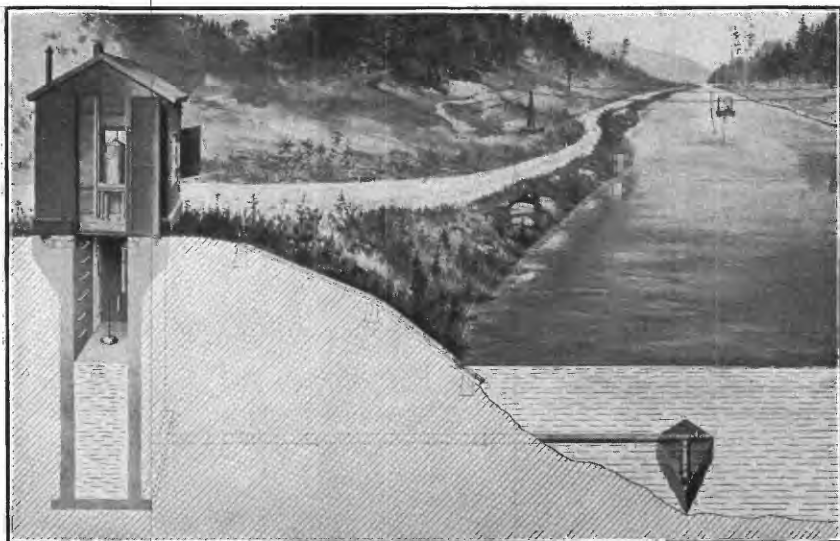
The description of the station gives, in addition to statements regarding location and equipment, information in regard to any conditions that may affect the constancy of the discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of channel, and the cause and effect of backwater; it gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with automatic gages the true mean daily discharge may be obtained by weighting discharge for parts of the day.

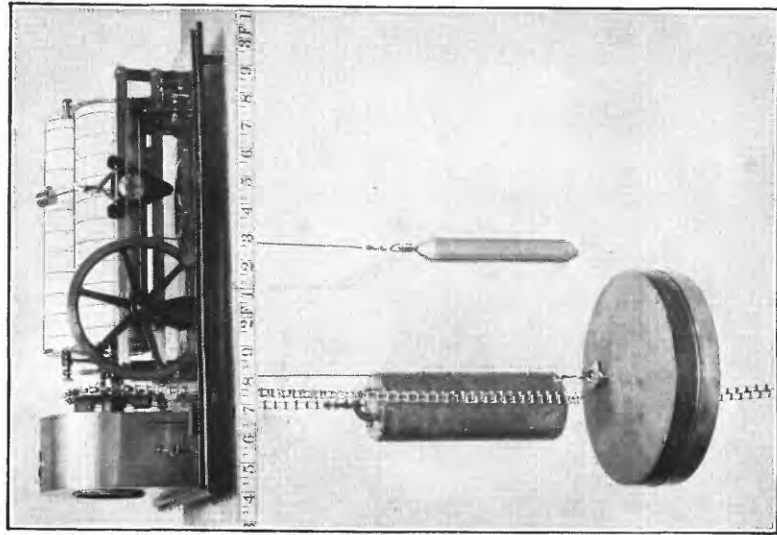
In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when



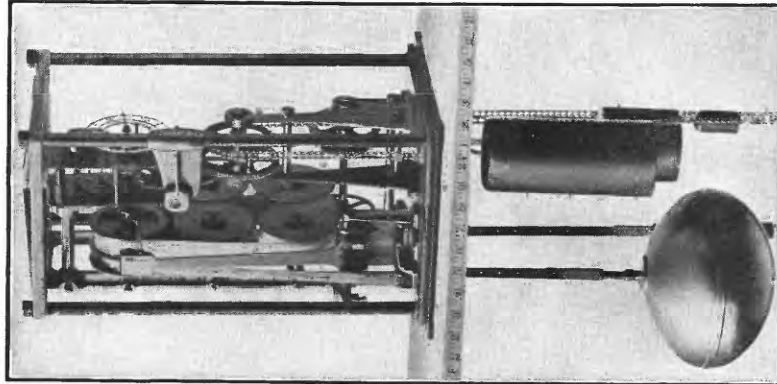
A. PRICE CURRENT METERS.



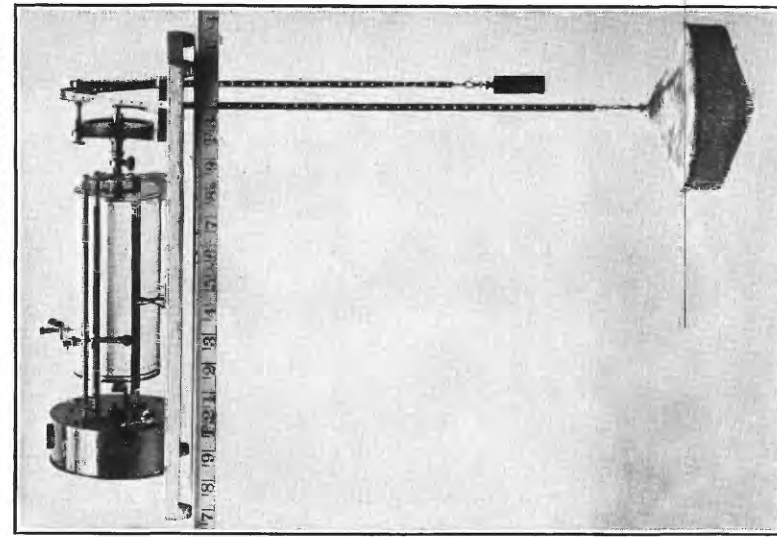
B. TYPICAL GAGING STATION.



A. STEVENS.



B. GURLEY PRINTING.
WATER-STAGE RECORDERS.



C. FRIEZ.

the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this average flow computations recorded in the remaining columns, which are defined on page 8, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends primarily (1) on the permanency of the discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Footnotes added to the daily discharge tables give information regarding the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables, "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate" within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The letter in the column headed "Accuracy" in the monthly discharge table rates the accuracy of the monthly mean and not that of the estimate of maximum or minimum discharge or the discharge for any one day. The rating is determined by considering the accuracy of the rating curve, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "Run-off (depth in inches)" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "Second-feet per square mile" and "Run-off (depth in inches)" previously published by the Survey should be used with caution because of possible inherent sources of error not known to the Survey.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

COOPERATION.

During the year ending September 30, 1914, the work in Washington, Montana, and Idaho has been done under cooperative agreements between the United States Geological Survey and the respective States.

Cooperation with the States is effected under contracts which are made between the Director of the Federal Survey and the State engineers or other officials and are authorized by legislative acts appropriating moneys. The State contracts are essentially of the same order, the principal provisions being substantially as follows:

1. The United States Geological Survey retains direct supervision of the field work and the preparation of the data for publication.

2. The Federal Survey retains possession of all material collected—field notes, maps, etc.—but this material is open at all times to inspection by the State officials, and if not satisfactory the agreements can be terminated at any time.

3. The salaries of gage observers and the salaries and traveling and field expenses of the engineers are divided between the two parties in some manner agreed upon, the accounts being rendered monthly in accordance with the regulations of the Federal Survey.

4. The streams and localities in which investigations shall be made are determined by conference between the State officials and the representatives of the United States Geological Survey.

5. The cost of publication is borne entirely by the Federal Survey.

In general, the cooperative agreements specify that the United States Geological Survey shall allot from its appropriation a sum equal to that appropriated from State funds.

The work in Washington was done in cooperation with the Board of Geological Survey, composed of Ernest Lister, governor; L. F. Hart, lieutenant governor; Edward Neath, treasurer; T. F. Kane, president of the University of Washington; and E. A. Bryan, president of the State college. The board was very efficiently represented in the cooperative investigations by Henry Landes, State geologist.

Special acknowledgments are due to A. W. Mahon, State engineer of Montana, and to F. P. King, State engineer of Idaho, for the very efficient manner in which they represented their States in the cooperative investigations.

Acknowledgments are also due to the engineers and employees of the United States Reclamation Service, the United States Forest Service, and of the United States Office of Indian Affairs for assistance, suggestions, and the freest use of data gathered exclusively for them and for which they have paid. Acknowledgments are also due to the officers of the United States Weather Bureau for hydrographic and climatologic data and to the United States Bureau of Fisheries for furnishing gage heights.

The following cities, private companies, and irrigation districts have cooperated in the collection of records: City of Bellingham, Wash., Skagit Power Co., Ham Yearsley & Ryrie Co., Spokane Valley Land & Water Co., Similkameen Power Co., Wenatchee Valley Gas & Electric Co., and Quincy Valley Irrigation District.

DIVISION OF WORK.

The field data were collected under the supervision of G. L. Parker and W. A. Lamb, district engineers, by F. B. Storey, A. H. Tuttle, James E. Stewart, J. T. Hartson, C. O. Brown, I. L. Collier, B. E. Jones, and J. M. Ray, and by E. W. Kramer, Forest Service hydrographer.

The field data in the Yakima River Basin, exclusive of gaging stations in the Yakima Indian Reservation, and the ratings, special estimates, analyses, and computations were made in cooperation with Paul Taylor, engineer in charge of hydrometric work, United States Reclamation Service, assisted by F. E. Moxley, H. W. Humphrey, and R. R. Calland.

The ratings, special estimates, analyses, and computations for stations in Washington and Idaho were made under the direction of G. L. Parker, district engineer, assisted by A. H. Tuttle, C. O. Brown, J. T. Hartson, and I. L. Collier. The ratings, special estimates, analyses, and computations for stations in Montana were made under the direction of W. A. Lamb, district engineer, assisted by B. E. Jones.

The manuscript has been prepared under the direction of G. C. Stevens by James E. Stewart.

GAGING-STATION RECORDS.

QUINAULT RIVER BASIN.

QUINAULT RIVER AT QUINAULT, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 8, T. 23 N., R. 9 W., at mouth of Canoe Creek, north end of Quinault Lake, at Quinault post office.

DRAINAGE AREA.—273 square miles.

RECORDS AVAILABLE.—October 1, 1911, to September 30, 1914.

GAGE.—Vertical staff in two sections about 400 feet above mouth of Canoe Creek.

DISCHARGE MEASUREMENTS.—Made from cable half a mile below the outlet of lake and about 4 miles below the gage.

CHANNEL AND CONTROL.—Permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for the period 1911-1914, 16.3 feet at 8 a. m., January 6 (discharge, 32,500 second-feet); minimum stage recorded, 0.45 foot at 8 a. m. and 6 p. m. September 6 (discharge, 538 second-feet).

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS AND STORAGE.—Diversions, none; storage, natural, in Quinault Lake.

ACCURACY.—Results good.

Discharge measurements of Quinault River at Quinault, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
May 30	Collier and Tuttle.....	2.82	2,660
30	Tuttle and Collier.....	2.78	2,530

NOTE.—Discharge determined from a rating curve well defined below 8,000 second-feet.

Daily discharge, in second-feet, of Quinault River at Quinault, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,010	1,240	7,100	2,670	4,580	4,430	2,080	2,080	2,790	2,670	1,010	620
2.....	1,010	1,240	5,530	2,910	3,570	5,530	2,080	2,430	3,040	2,790	1,010	592
3.....	940	1,160	4,430	3,850	3,170	5,050	2,310	2,790	3,170	2,790	1,010	565
4.....	870	1,160	3,710	15,200	2,790	4,430	3,170	2,670	2,910	2,790	1,080	565
5.....	870	1,970	3,300	23,100	2,430	3,710	5,530	2,550	2,550	2,550	1,080	565
6.....	814	2,790	3,170	30,700	2,080	3,170	5,210	2,310	2,310	2,430	1,080	538
7.....	870	3,170	3,040	23,100	2,080	2,790	4,280	2,310	2,080	2,310	1,080	565
8.....	870	3,170	2,310	15,700	1,770	2,670	3,710	2,310	2,790	2,190	1,080	592
9.....	870	3,990	2,550	9,890	1,670	2,550	3,300	2,550	3,300	2,080	1,010	592
10.....	1,160	4,280	2,430	7,280	1,580	2,310	3,300	2,670	3,040	2,080	1,010	565
11.....	5,700	3,710	2,310	6,380	1,670	2,190	3,300	2,550	2,790	2,080	940	565
12.....	7,650	3,040	2,670	5,530	1,870	2,190	3,170	2,550	2,670	2,080	940	565
13.....	11,600	2,550	2,670	5,210	1,870	2,190	3,430	2,670	2,790	2,080	940	565
14.....	8,240	2,190	3,300	4,890	1,870	2,910	4,430	2,910	2,670	2,080	870	565
15.....	6,210	2,190	3,990	4,730	1,870	3,990	5,870	3,300	2,910	1,970	870	592
16.....	4,890	8,640	3,570	5,210	1,870	3,990	5,700	3,040	3,300	1,870	870	740
17.....	3,850	7,840	3,570	4,890	1,870	3,990	4,730	2,790	3,300	1,870	870	940
18.....	3,170	5,870	3,300	4,730	1,870	3,710	3,990	2,790	3,300	1,870	800	1,770
19.....	2,790	4,890	2,910	4,430	1,870	3,570	3,990	2,670	3,170	1,870	770	4,730
20.....	2,550	4,430	2,550	4,130	1,870	3,430	4,130	2,550	2,790	1,870	740	7,100
21.....	2,190	3,850	2,310	3,570	2,080	3,570	3,710	2,670	2,670	1,670	740	4,730
22.....	1,970	3,850	2,310	3,300	2,910	3,430	3,300	2,790	2,550	1,490	740	3,430
23.....	1,870	5,370	2,080	3,040	3,040	3,170	3,040	3,040	2,310	1,400	710	2,670
24.....	1,670	17,900	1,970	2,790	3,300	2,910	2,790	3,040	2,310	1,400	680	2,080
25.....	1,580	17,900	1,970	2,670	3,040	2,790	2,430	3,040	2,790	1,320	680	1,770
26.....	1,490	13,800	1,970	3,430	2,790	2,550	2,430	3,040	2,790	1,320	680	1,670
27.....	1,400	13,100	1,970	3,570	3,850	2,310	2,310	3,300	2,790	1,320	680	1,770
28.....	1,320	9,680	2,080	3,040	3,850	2,310	2,190	3,040	2,670	1,320	650	1,870
29.....	1,240	10,300	1,970	3,300	.....	2,310	2,190	2,790	2,550	1,240	650	1,670
30.....	1,240	9,680	1,970	3,990	.....	2,310	2,080	2,550	2,550	1,080	626	1,670
31.....	1,160	.....	2,550	4,430	.....	2,310	.....	2,550	.....	1,010	632	.....

NOTE.—Discharge determined from a rating curve well defined below 8,000 second-feet.

Monthly discharge of Quinault River at Quinault, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 273 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	11,600	814	2,680	9.82	11.32	165,000	A.
November.....	17,900	1,160	5,830	21.4	23.88	347,000	A.
December.....	7,100	1,970	2,950	10.8	12.45	181,000	A.
January.....	30,700	2,670	7,150	26.2	30.21	440,000	B.
February.....	4,580	1,580	2,470	9.05	9.42	137,000	A.
March.....	5,530	2,190	3,190	11.7	13.49	196,000	A.
April.....	5,870	2,080	3,470	12.7	14.17	206,000	A.
May.....	3,300	2,080	2,720	9.96	11.48	167,000	A.
June.....	3,300	2,080	2,790	10.2	11.38	166,000	A.
July.....	2,790	1,010	1,900	6.96	8.02	117,000	A.
August.....	1,080	626	856	3.14	3.62	52,600	A.
September.....	7,100	538	1,570	5.75	6.42	93,400	A.
The year.....	30,700	538	3,130	11.5	155.86	2,270,000	

PUGET SOUND DRAINAGE BASIN.

NISQUALLY RIVER NEAR ASHFORD, WASH.

LOCATION.—In the SW. $\frac{1}{4}$ sec. 33, T. 15 N., R. 7 E., about half a mile below west boundary of Mount Rainier National Park and 7 miles east of Ashford.

DRAINAGE AREA.—73 square miles.

RECORDS AVAILABLE.—October 28, 1910, to September 30, 1914, when station was discontinued; fragmentary.

GAGE.—Record of stage obtained by measuring down from a reference point on a foot log.

DISCHARGE MEASUREMENTS.—Made from cable 100 yards below foot log or by wading.

CHANNEL AND CONTROL.—Sand and gravel; shifting.

EXTREMES OF STAGE.—Maximum stage recorded during year, 7.5 feet January 5; minimum stage recorded, 4.1 feet October 4, 6, and 8.

1910-1914: Maximum stage recorded, 7.5 feet January 5, 1914 (discharge not computed); minimum stage recorded, 3.6 feet February 24 to March 6, 1911 (discharge, 92 second-feet).

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—None.

COOPERATION.—Gage-height record furnished by officers of the Mount Rainier National Park.

Data too meager to warrant publication of estimates of discharge.

Discharge measurements of Nisqually River near Ashford, Wash., from Oct. 1, 1913, to Oct. 8, 1914.

Date.	Made by—	Gage height.	Discharge.
Oct. 4	James E. Stewart.....	<i>Feet.</i> 4.22	<i>Sec.-ft.</i> 262
July 13	I. L. Collier.....	5.22	721
Oct. 8	do.....	4.42	276

Daily gage height, in feet, of Nisqually River near Ashford, Wash., for the year ending Sept. 30, 1914.

[F. C. Moore, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.		4.5	4.8	4.3	5.0	5.7	4.9	5.1			5.3	
2.	4.4		4.7	4.3	5.0	5.5	4.85		5.5			
3.	4.25	4.3	4.7	4.3	5.0	5.4	4.8		5.3		5.3	
4.	4.1	4.3		5.7	5.0	5.3	5.4	5.3	4.9		5.2	
5.		4.35	4.5	7.5	4.9	5.3		5.3	4.7			
6.	4.1	4.5	4.55	6.8	4.9	5.2	5.4	5.2	4.5		5.1	
7.	4.18	4.75	4.4	6.8	4.9	5.2	5.4		4.6		5.0	
8.	4.1		4.45	6.0		5.2	5.4	5.3	4.5	5.2	5.0	
9.	4.6		4.45	5.75	4.9	5.2	5.4	5.3	4.5	5.2		
10.	5.0		4.4		4.9	5.2	5.45		4.7	5.2	5.0	
11.	5.4		4.4		4.9	5.2	5.45	5.3		5.3		
12.	4.75		4.4	5.5	4.9	5.4		5.3			5.2	
13.	5.25		4.4	5.4	4.9	5.4	5.6	5.5		5.2		
14.				5.35	4.9	5.6		5.6		5.1	5.0	
15.	4.7		4.4	5.35						5.2		4.6
16.	4.6		4.4	5.3	4.9	5.6			5.4	5.2		4.6
17.	4.45			5.3	4.9	5.6	5.5			5.2	4.8	
18.					4.9	5.5	5.4	4.8	5.2	5.1	5.0	4.6
19.			4.3	5.2	4.9	5.5	5.55	4.7	5.2		5.0	
20.			4.3	5.1	4.9	5.5	5.4	5.0	5.1	5.1	5.1	
21.			4.3	5.2	4.9		5.2	5.1		5.1	5.0	4.7
22.	4.5		4.3	5.2			5.2		4.8	5.1		
23.	4.55		4.3			5.3	5.1	5.2	4.8	5.1	5.0	
24.	5.22		4.3		5.25	5.3	5.0			5.0		
25.	4.75				5.2		4.9	4.8	5.0	5.0	5.0	4.8
26.					5.2		4.9	4.7				4.8
27.	4.5		4.3	5.1	5.4			4.6		5.1		
28.	4.4		4.3		5.4		4.9	4.15				4.6
29.	4.45			5.1			4.9	4.4		5.1		4.6
30.	4.45			5.1						5.1		4.6
31.	4.4			5.1						5.3		

PUYALLUP RIVER NEAR ELECTRON, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 3, T. 16 N., R. 6 E., about 1,000 feet above the intake of the Puget Sound Traction, Light & Power Co.'s flume, one-fourth mile below Mowich River, and about 10 miles southeast of Electron.

DRAINAGE AREA.—91 square miles.

RECORDS AVAILABLE.—January 1, 1909, to September 30, 1914.

GAGE.—Friez water-stage recorder.

DISCHARGE MEASUREMENTS.—Made from log bridge near the gage.

CHANNEL AND CONTROL.—Gravel and boulders; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.05 feet at 11.30 p. m. January 4 (discharge 2,610 second-feet); minimum stage recorded, 0.64 foot at 5 p. m. December 29 (discharge 172 second-feet).

1909-1914: Maximum stage recorded, 4.6 feet November 10, 1910 (discharge, 3,200 second-feet); minimum stage recorded, 0.65 foot January 17, 1910 (discharge, 120 second-feet).

WINTER FLOW.—Discharge relation not materially affected by ice.

DIVERSIONS.—None above station.

ACCURACY.—Results fair.

COOPERATION.—Gage-height records and results of discharge measurements furnished by Puget Sound Traction, Light & Power Co.

Discharge measurements of Puyallup River near Electron, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 7	Barber and Waite.....	1.19	427	Apr. 7	Barber and Waite.....	1.08	445
28	do.....	1.07	324	21	do.....	1.25	493
Nov. 9	do.....	1.17	402	May 9	do.....	1.03	431
23	do.....	1.52	677	26	do.....	.97	403
Dec. 5	Barber and Bargwardt.	.97	309	June 9	do.....	.97	388
23	Barber and Waite.....	.69	184	27	do.....	1.07	473
Jan. 10	do.....	1.43	631	July 10	do.....	1.46	699
25	do.....	1.01	411	26	do.....	1.13	478
Feb. 6	do.....	.53	212	Aug. 14	do.....	1.70	807
28	Barber and Bargwardt.	1.24	525	23	do.....	1.29	536
Mar. 10	Barber and Waite.....	.90	335	Sept. 10	do.....	.81	278
23	do.....	1.02	401	23	do.....	1.04	387

Daily discharge, in second-feet, of Puyallup River near Electron, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	340	306	412	193	266	1,080	235	396	775	821	729	397
2.....	369	275	377	218	248	682	271	514	891	930	677	485
3.....	290	254	350	226	231	558	384	608	755	912	719	452
4.....	260	274	328	1,380	252	456	574	490	514	775	709	332
5.....	239	286	309	2,530	219	388	716	429	408	608	722	291
6.....	302	476	320	2,320	207	364	533	418	340	594	629	352
7.....	502	387	320	2,060	204	364	456	434	353	630	517	312
8.....	320	385	303	1,280	198	383	424	440	508	678	628	254
9.....	292	401	289	829	188	368	429	440	417	679	577	242
10.....	682	407	273	655	235	344	542	490	363	704	585	252
11.....	725	364	293	539	248	349	514	520	378	780	671	248
12.....	806	318	278	462	242	393	485	520	454	875	774	207
13.....	1,010	300	272	419	228	462	686	624	502	815	768	210
14.....	658	290	272	373	216	577	682	800	562	702	720	380
15.....	530	292	256	344	216	570	1,240	779	734	715	640	376
16.....	481	457	239	322	228	668	774	648	845	705	458	292
17.....	414	536	234	309	231	590	568	582	800	800	371	443
18.....	407	412	226	285	245	527	527	526	736	852	420	696
19.....	440	377	213	255	277	502	765	482	614	907	495	680
20.....	422	343	196	235	289	502	669	527	526	659	540	557
21.....	390	333	199	364	362	496	531	608	490	461	523	422
22.....	370	355	195	738	409	456	453	621	410	487	499	350
23.....	360	675	187	447	354	419	404	608	363	524	482	360
24.....	669	760	183	373	368	393	368	570	508	525	478	388
25.....	467	583	187	378	322	359	344	508	496	496	507	450
26.....	452	513	187	368	296	322	343	423	461	481	513	429
27.....	385	479	187	318	704	296	350	423	450	512	527	342
28.....	317	433	182	285	638	281	323	363	560	496	558	309
29.....	313	513	174	282	.....	277	313	349	550	552	487	304
30.....	293	450	174	285	.....	262	332	377	676	660	466	289
31.....	318	.....	217	289	.....	245	.....	524	.....	762	391	.....

NOTE.—Discharge determined from several rating curves fairly well defined between 200 and 700 second-feet, and by indirect method for shifting channels.

Monthly discharge of Puyallup River near Electron, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 91 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	1,010	239	446	4.90	5.65	27,400	B.
November.....	760	254	408	4.48	5.00	24,300	B.
December.....	412	174	253	2.78	3.20	15,600	B.
January.....	2,530	193	624	6.86	7.91	38,400	A.
February.....	704	188	290	3.19	3.32	16,100	A.
March.....	1,080	245	449	4.93	5.68	27,600	A.
April.....	1,240	235	508	5.58	6.23	30,200	A.
May.....	800	349	517	5.68	6.55	31,800	A.
June.....	891	340	548	6.02	6.72	32,600	A.
July.....	930	461	681	7.48	8.62	41,900	A.
August.....	774	371	574	6.31	7.28	35,300	A.
September.....	696	207	370	4.07	4.54	22,000	A.
The year.....	2,530	174	474	5.21	70.70	343,000	

WHITE RIVER AT BUCKLEY, WASH.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 34, T. 20 N., R. 6 E., at the Northern Pacific Railway bridge about a mile northeast of Buckley.

DRAINAGE AREA.—244 square miles.

RECORDS AVAILABLE.—April 22, 1899, to August 31, 1903 (gage-height record only Jan. 1, 1902, to Aug. 31, 1903); October 1, 1910, to December 31, 1911; January 18, 1913 to September 30, 1914.

GAGE.—Vertical staff and Fuller water-stage recorder.

DISCHARGE MEASUREMENTS.—Made from a plank walk on lower crossbeam of the railway bridge.

CHANNEL AND CONTROL.—Large boulders and cobblestones; likely to shift during floods; gradient very steep.

EXTREMES OF DISCHARGE.—Maximum estimated combined discharge during year (derived from water-stage recorder), of river and flume 5,760 second-feet at 2 a. m., January 6; minimum discharge (river and flume) for one day, 405 second-feet September 24.

1899–1901, 1911, and 1913–1914: Maximum discharge (river and flume) estimated at 14,600 second-feet, November 22, 1901; minimum discharge estimated at 390 second-feet October 3–4 and 19–26, 1911.

DIVERSION.—White River flume diverts from river about a mile above gage. Total monthly discharge is computed from the combined flow of river and canal.

ACCURACY.—Results good. Frequent measurements are required to define the rating curve.

COOPERATION.—Gage-height record and results of some discharge measurements by Puget Sound Light & Traction Co.

Discharge measurements of White River at Buckley, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 7	Parker and Ludlow.....	628.06	5,020	Sept. 1	Collier and Earnisse.....	624.06	6.2
9	Ludlow and Osgood.....	627.37	2,500	2	.....do.....	625.30	296
Feb. 18	.....do.....	624.94	130	2	.....do.....	625.27	277
19	.....do.....	625.58	397	3	.....do.....	624.96	147

Daily discharge, in second-feet, of White River at Buckley, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	10	40	489	29	483	1,820	337	990	1,500	873	223	8
2.....	8	30	423	18	423	1,570	347	1,240	1,880	956	228	79
3.....	7	19	362	20	357	1,600	489	1,630	1,790	956	240	48
4.....	7	14	317	96	435	1,470	820	1,600	1,410	890	154	9
5.....	7	22	289	3,610	368	458	1,260	1,440	1,070	665	15	7
6.....	8	411	261	5,230	298	236	1,160	1,290	873	725	17	9
7.....	258	347	227	4,510	279	227	970	1,100	1,880	890	12	17
8.....	206	298	117	3,640	270	302	1,040	820	1,420	918	12	16
9.....	114	293	80	2,770	261	768	1,140	794	1,370	882	12	15
10.....	103	440	52	1,630	332	1,160	1,220	785	1,280	873	12	14
11.....	562	452	40	1,290	395	811	1,280	802	1,250	890	14	14
12.....	511	379	33	1,030	417	678	1,240	1,100	1,250	928	14	13
13.....	542	317	20	718	429	865	1,460	1,990	1,450	918	17	13
14.....	723	270	69	618	411	1,260	1,570	2,290	1,580	781	14	18
15.....	876	253	470	548	395	1,540	2,010	2,500	1,560	650	36	25
16.....	1,220	429	223	476	373	1,570	1,910	2,090	2,050	566	298	19
17.....	678	618	22	435	189	1,600	1,600	1,760	1,860	566	688	18
18.....	253	596	18	384	89	1,580	1,440	1,600	1,650	566	695	137
19.....	663	502	14	312	368	1,520	1,820	1,480	1,520	665	44	215
20.....	312	411	14	219	411	1,470	2,010	1,470	1,830	725	9	81
21.....	141	347	14	227	446	1,380	1,950	1,560	1,010	507	8	55
22.....	12	289	13	1,140	626	1,260	1,540	1,650	1,822	441	7	44
23.....	9	384	13	980	694	1,140	626	1,680	636	435	9	36
24.....	185	702	12	1,140	940	1,040	846	1,820	789	401	8	170
25.....	508	656	12	893	970	940	1,090	1,760	1,630	284	8	14
26.....	384	568	13	1,040	794	759	1,040	1,480	1,500	177	9	11
27.....	395	589	12	865	1,670	694	1,050	1,350	1,280	174	9	12
28.....	174	521	18	626	1,540	555	990	1,210	658	170	8	11
29.....	24	521	12	464	.....	476	940	1,210	710	163	9	11
30.....	112	515	13	476	.....	458	902	1,050	765	188	11	11
31.....	395	.....	32	458	.....	406	.....	1,110	.....	215	9	.....

NOTE.—Discharge determined from rating curves fairly well defined between 60 and 1,200 second-feet applicable as follows; Oct. 1-16; Oct. 17, to May 15, and May 16 to Sept. 30.

Monthly discharge of White River at Buckley, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	1,220	7	303	18,600	B.
November.....	702	14	374	22,300	B.
December.....	489	12	119	7,320	C.
January.....	5,230	18	1,160	71,300	B.
February.....	1,670	89	524	29,100	B.
March.....	1,820	227	1,020	62,700	B.
April.....	2,010	337	1,200	71,400	B.
May.....	2,500	785	1,440	88,500	B.
June.....	2,050	636	1,320	78,600	B.
July.....	956	163	614	37,800	B.
August.....	695	7	94.9	5,650	C.
September.....	215	7	38.3	2,280	C.
The year.....	5,230	7	685	496,000	

Monthly discharge of White River and flume at Buckley, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 424 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	1,620	432	919	2.17	2.50	56,500	B.
November.....	1,270	651	960	2.26	2.52	57,100	B.
December.....	1,060	426	679	1.60	1.84	41,800	B.
January.....	5,250	650	1,750	4.13	4.76	108,000	B.
February.....	2,320	801	1,110	2.62	2.73	61,600	B.
March.....	2,480	968	1,620	3.82	4.40	99,600	B.
April.....	2,640	922	1,790	4.22	4.71	107,000	B.
May.....	2,640	1,470	2,040	4.81	5.54	125,000	B.
June.....	2,610	1,120	1,700	4.01	4.47	101,000	B.
July.....	1,880	927	1,320	3.11	3.58	81,200	B.
August.....	1,140	676	866	2.04	2.35	53,200	B.
September.....	847	405	588	1.39	1.55	35,000	B.
The year.....	5,250	405	1,280	3.02	40.95	927,000	

WHITE RIVER FLUME AT BUCKLEY, WASH.

LOCATION.—In sec. 35, T. 20 N., R. 6 E., about one-fourth mile below intake and about a mile northeast of Buckley.

RECORDS AVAILABLE.—January 18 to September 30, 1914.

GAGE.—Vertical staff and Fuller water-stage recorder.

DISCHARGE MEASUREMENTS.—Made from crossties on top of flume. Stay line used for high velocities.

EXTREMES OF DISCHARGE.—Maximum stage during year (from water-stage recorder charts), 4.88 feet at 3 p. m. April 22 (discharge, 1,290 second-feet); minimum stage recorded, 0.20 foot October 16, May 13, 14, and June 25 and 26 (discharge, 16 second-feet).

1913-14: Maximum stage recorded, 5.01 feet April 18, 1913 (discharge, 1,400 second-feet); minimum stage recorded, 0.20 foot April 20, May 1-4, 17, 22, 24, 26, and October 16, 1913 (discharge, 15 second-feet).

ACCURACY.—Results good.

COOPERATION.—Gage-height record and results of some discharge measurements furnished by Puget Sound Traction, Light & Power Co.

Discharge measurements of White River flume at Buckley, Wash., during the year ending Sept. 30, 1914.

[Made by Collier and Eernisse.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
Sept. 1.....	Feet.	Sec.-ft.	Sept. 2.....	Feet.	Sec.-ft.	Sept. 3.....	Feet.	Sec.-ft.
2.....	2.83	596	2.....	1.98	328	3.....	2.49	466
	3.24	706		1.19	151		2.49	470

Daily discharge, in second-feet, of White River flume at Buckley, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	525	747	570	632	600	664	585	510	664	908	834	648
2.....	540	664	570	632	600	664	585	525	730	908	852	510
3.....	540	632	570	632	600	202	600	540	798	927	870	585
4.....	525	664	570	946	600	206	616	540	764	908	946	632
5.....	495	696	570	119	600	1,020	632	540	713	852	984	585
6.....	540	764	570	23	585	1,100	648	540	510	781	946	600
7.....	648	764	616	23	585	1,100	664	908	18	555	870	632
8.....	585	680	632	23	585	1,180	600	1,060	18	555	908	540
9.....	680	648	632	220	540	908	570	1,020	18	555	870	525
10.....	870	540	632	798	510	180	570	1,020	18	540	852	495
11.....	1,060	452	632	764	510	278	570	1,020	43	534	908	510
12.....	984	452	632	834	510	585	585	370	58	570	946	466
13.....	908	452	632	852	510	585	600	16	18	616	984	452
14.....	570	452	357	798	510	616	600	16	19	600	1,020	632
15.....	233	452	149	764	510	632	616	52	21	680	1,100	764
16.....	16	540	370	730	510	632	616	555	23	730	410	616
17.....	332	570	600	730	696	570	600	764	274	730	46	600
18.....	747	570	600	713	730	525	600	764	600	730	46	696
19.....	370	570	585	696	525	525	632	764	424	664	632	632
20.....	680	570	570	730	504	525	632	764	525	600	764	600
21.....	764	570	540	764	555	525	180	764	696	570	834	540
22.....	852	570	570	1,020	632	525	370	764	664	570	781	510
23.....	816	570	570	870	632	525	1,260	632	798	600	713	480
24.....	889	570	555	600	632	525	696	585	332	616	696	235
25.....	600	570	570	525	632	525	495	570	16	696	730	525
26.....	600	570	555	344	616	510	495	570	16	764	747	555
27.....	585	570	540	344	648	510	495	570	131	781	764	540
28.....	730	570	616	466	648	510	510	424	834	764	764	480
29.....	798	555	555	600	.....	510	510	370	852	764	730	466
30.....	320	570	540	600	.....	510	510	540	870	798	764	480
31.....	287	.....	680	600	.....	570	.....	632	.....	870	680	.....

NOTE.—Discharge determined from a rating curve well defined between 100 and 1,200 second-feet.

Monthly discharge of White River flume at Buckley, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	1,060	16	616	37,900	A.
November.....	764	452	585	34,800	A.
December.....	680	149	560	34,400	A.
January.....	1,020	23	593	36,500	A.
February.....	730	504	583	32,400	A.
March.....	1,180	180	595	36,600	A.
April.....	1,260	180	588	35,000	A.
May.....	1,060	16	604	37,100	A.
June.....	870	16	382	22,700	B.
July.....	927	534	701	43,100	A.
August.....	1,100	46	774	47,600	A.
September.....	764	235	550	32,700	A.
The year.....	1,260	16	595	431,000	

SOUTH FORK OF SKYKOMISH RIVER NEAR INDEX, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 29, T. 27 N., R. 10 E., 300 feet above Sunset Falls, about 2 miles above town of Index and mouth of North Fork of Skykomish River.

DRAINAGE AREA.—351 square miles.

RECORDS AVAILABLE.—October 7, 1902, to September 30, 1905; April 26, 1911, to October 21, 1912; June 14, 1913, to September 30, 1914.

GAGE.—April 26, 1911, to February 25, 1914, vertical staff at same site as gage used 1902 to 1905, but at datum 0.61 foot higher; April 19 to September 30, 1914, vertical staff in two sections at same site as gage used 1902 to 1905 but at datum 0.39 foot lower; inclined section for low water-gage readings installed August 25, 1914.

DISCHARGE MEASUREMENTS.—Made from cable 1 mile below gage.

CHANNEL AND CONTROL.—Sunset Falls, 300 feet below gage; solid rock.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 17.0 feet (water over gage; estimated by observer) at 10.05 a. m. January 6 (discharge, 16,700 second-feet; minimum stage recorded, 2.05 feet at 1.05 p. m. October 1 (discharge, 718 second-feet).

1902–1905, 1911–1914: Maximum stage recorded 17.0 feet at 10.05 a. m. January 6, 1914 (discharge, 16,700 second-feet). Datum for 1914 is 1 foot lower than for 1913. Minimum discharge for year differs from that recorded in daily discharge table, because gage heights were used to tenths of feet only in computing daily discharge. Minimum stage recorded for period, 0.55 foot (0.94 foot, present datum) October 10, 1904 (discharge, 372 second-feet).

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS AND STORAGE.—None.

ACCURACY.—Results good.

Discharge measurements of South Fork of Skykomish River near Index, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Nov. 5	James E. Stewart.....	<i>Feet.</i> a 3.75	<i>Sec.-ft.</i> 1,470	Aug. 25	I. L. Collier.....	<i>Feet.</i> b 2.16	458
Apr. 22	Parker and Collier.....	6.49	3,450	25	.....do.....	b 2.16	476

a Referred to datum of gage installed Apr. 19, 1914.

b Discharge relation affected by logging operations at Sunset Falls.

Daily discharge, in second-feet, of South Fork of Skykomish River near Index, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1.....	700	1,100	2,780	850	1,350	4,440	1,520	3,290	4,650	2,470	.....
2.....	736	1,150	2,540	850	1,410	3,290	1,580	4,650	4,870	2,620	.....
3.....	774	1,250	2,170	812	1,300	3,290	1,640	5,560	4,440	2,390	.....
4.....	774	1,150	1,890	2,860	1,350	2,170	2,310	4,440	3,290	2,240	.....
5.....	736	1,520	1,770	10,400	1,300	2,170	3,840	3,470	2,780	2,030	.....
6.....	774	2,170	1,580	16,700	1,200	1,770	3,120	3,470	2,470	1,960	.....
7.....	850	2,470	1,520	10,300	1,010	1,770	3,120	3,470	2,940	1,700	.....
8.....	1,010	2,310	1,470	6,930	930	1,770	3,290	3,650	3,200	1,640	.....
9.....	1,200	2,240	1,350	4,870	850	1,770	3,650	3,560	2,780	.....	.....
10.....	2,540	2,170	1,300	3,650	812	1,890	3,840	3,840	2,390	.....	.....
11.....	10,700	2,240	1,250	2,940	812	1,890	3,470	3,650	2,620	.....	.....
12.....	5,560	2,470	1,250	2,540	850	2,030	3,650	4,240	2,940	.....	.....
13.....	6,540	2,700	1,300	2,170	850	2,310	4,040	5,320	2,860	.....	.....
14.....	4,650	2,780	1,250	1,890	850	4,440	4,870	6,670	3,290	.....	.....
15.....	3,740	3,030	1,300	1,830	812	4,870	7,580	6,540	4,140	.....	1,640
16.....	3,120	10,000	1,200	1,830	850	5,090	5,800	5,560	4,040	.....	1,470
17.....	2,780	5,090	1,250	1,700	890	4,440	3,840	5,200	3,940	.....	1,100
18.....	2,390	4,040	1,200	1,580	890	3,840	4,640	4,980	3,650	.....	1,300
19.....	2,470	3,040	1,100	1,470	972	3,290	5,440	4,870	3,030	.....	2,390
20.....	2,470	3,030	1,010	1,410	1,010	3,470	5,560	4,760	2,940	.....	3,120
21.....	2,390	2,470	972	1,350	1,150	2,780	4,140	4,650	3,030	.....	1,960
22.....	2,310	2,390	930	1,150	1,890	2,470	3,560	4,870	2,620	.....	1,400
23.....	2,240	3,200	890	1,350	2,100	2,170	3,120	4,650	2,030	.....	1,060
24.....	2,030	3,120	850	1,300	3,290	2,470	2,940	4,540	2,240	.....	972
25.....	1,700	3,290	812	1,300	3,120	2,470	2,620	4,340	2,620	.....	1,010
26.....	1,520	3,840	774	1,250	2,950	1,890	2,700	4,040	2,470	.....	930
27.....	1,520	3,840	774	1,250	2,780	2,030	2,780	3,470	2,470	.....	1,410
28.....	1,410	2,940	774	1,200	5,090	1,770	2,620	3,030	2,310	.....	1,090
29.....	1,300	3,290	774	1,250	.....	1,300	2,310	2,700	2,470	.....	850
30.....	1,200	3,290	736	1,300	.....	1,640	2,470	2,940	2,780	.....	850
31.....	1,150	.....	774	1,300	.....	1,410	.....	3,840	.....	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. Gage destroyed by falling tree Feb. 25; replaced Apr. 19. Gage record obtained by measuring down from reference point Feb. 26 to Apr. 18. All gage heights reduced to datum of gage installed Apr. 19, 1914. Discharge relation affected by logging operations over Sunset Falls July 9 to Sept. 14; discharge not estimated.

Monthly discharge of South Fork of Skykomish River near Index, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 351 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	10,700	700	2,360	6.72	7.75	145,000	A.
November.....	10,000	1,100	2,930	8.35	9.32	174,000	A.
December.....	2,780	736	1,280	3.65	4.21	78,700	A.
January.....	^a 16,700	812	2,960	8.43	9.72	182,000	A.
February.....	5,690	812	1,520	4.33	4.51	84,400	A.
March.....	5,690	1,300	2,660	7.58	8.74	164,000	A.
April.....	7,580	1,520	3,540	10.1	11.27	211,000	A.
May.....	6,670	2,700	4,330	12.3	14.18	266,000	A.
June.....	4,870	2,030	3,080	8.77	9.78	183,000	A.
July 1-8.....	2,620	1,640	2,130	6.07	1.81	33,800	A.
September 15-30.....	3,120	850	1,400	3.99	2.37	44,400	A.

^a Discharge Jan. 6 from estimated gage height, as water was over top of gage.

MILLER CREEK NEAR BERLIN, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 33, T. 26 N., R. 11 E., $1\frac{1}{4}$ miles above Berlin and mouth of the creek.

DRAINAGE AREA.—44.2 square miles.

RECORDS AVAILABLE.—May 24, 1911, to September 30, 1914; fragmentary.

GAGE.—Vertical staff in two sections on left bank. Lower section washed out November 18 and replaced December 5, 1911. Sloping gage 10 feet downstream substituted for lower section August 27, 1914.

DISCHARGE MEASUREMENTS.—Made from a cable 900 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of large boulders which will not shift except at extremely high stages. A log jam 500 feet below the gage, at a water-surface elevation about 5 feet lower than at gage, may affect discharge relation at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.2 feet at 4 p. m. October 11 (discharge, 3,030 second-feet); minimum stage recorded, 0.21 foot afternoon of September 26 (discharge, 32 second-feet).

1911-1914: Maximum discharge recorded, 5.5 feet November 18 and 19, 1911 (discharge, 4,740 second-feet); minimum stage recorded, 0.20 foot August 30 and 31 and September 1 and 3, 1911 (discharge, 31 second-feet).

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Miller Creek near Berlin, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
Apr. 23	Parker and Collier.....	<i>Feet.</i> 1.79	<i>Sec.-ft.</i> 392
Aug. 26	I. L. Collier.....	.21	33.8

Daily discharge, in second-feet, of Miller Creek near Berlin, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	92	109	.....	70	172	640	149	.....	810	510	.....	.....
2.	92	118	.....	77	160	432	149	.....	900	363	.....	.....
3.	100	109	.....	84	149	323	210	.....	640	456	.....	.....
4.	92	.....	254	407	128	287	385	.....	407	407	.....	.....
5.	92	.....	224	2,210	109	254	810	.....	323	363	.....	.....
6.	92	.....	224	2,750	92	197	510	.....	287	343	.....	.....
7.	100	323	197	1,950	92	224	456	.....	224	323	.....	.....
8.	92	224	172	720	84	323	456	.....	510	254	.....	.....
9.	109	323	160	510	77	305	510	.....	640	224	.....	.....
10.	407	407	128	363	77	254	570	.....	363	239	.....	.....
11.	3,030	287	172	287	70	224	570	.....	323	224	.....	.....
12.	1,210	224	172	224	77	224	456	.....	456	224	.....	.....
13.	1,320	172	172	210	84	343	720	.....	456	239	.....	.....
14.	810	172	184	197	92	1,000	810	.....	456	254	.....	.....
15.	510	224	197	172	92	640	1,320	.....	456	224	.....	.....
16.	456	2,470	149	172	92	1,000	.....	.....	900	210	.....	.....
17.	407	.....	149	172	84	720	.....	640	570	197	.....	.....
18.	323	.....	128	149	84	570	.....	570	640	197	.....	.....
19.	363	.....	109	128	84	540	.....	510	510	184	.....	.....
20.	407	.....	109	118	100	540	.....	570	363	145	.....	.....
21.	323	.....	92	128	128	510	.....	640	363	.....	.....	385
22.	254	.....	92	149	343	456	.....	720	323	.....	.....	.....
23.	224	.....	84	109	254	363	407	810	224	.....	.....	.....
24.	407	.....	77	100	270	343	.....	1,210	407	.....	.....	.....
25.	254	640	77	100	224	287	.....	810	363	.....	.....	.....
26.	197	456	77	109	172	239	.....	510	363	.....	32	.....
27.	197	.....	77	92	810	224	.....	456	407	.....	.....	.....
28.	172	.....	70	100	407	197	.....	407	363	.....	.....	.....
29.	149	.....	70	109	.....	172	.....	363	363	.....	.....	118
30.	128	.....	70	149	.....	172	.....	407	254	.....	.....	100
31.	118	.....	64	172	.....	160	.....	510	.....	.....	.....	.....

NOTE.—Discharge determined from a rating curve well defined below 500 second-feet. Owing to lack of gage readings discharge estimated at 15 per cent of the flow of the South Fork of the Skykomish near Index for periods as follows: Nov. 4-6, 242 second-feet; Nov. 17-24 and 27-30, 500 second-feet; Dec. 1-3, 375 second-feet; Apr. 16-22, 705 second-feet; Apr. 24-30, 395 second-feet; and May 1-16, 670 second-feet.

Monthly discharge of Miller Creek near Berlin, Wash., for the period Oct. 1, 1913, to July 20, 1914.

[Drainage area, 44.2 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.	3,030	92	404	9.14	10.54	24,800	B.
November.	.....	.....	433	9.80	10.93	25,800	D.
December.	.....	64	157	3.55	4.09	9,650	B.
January.	2,750	70	396	8.96	10.33	24,300	C.
February.	810	70	165	3.73	3.88	9,160	A.
March.	1,000	160	392	8.87	10.23	24,100	B.
April.	.....	.....	540	12.2	13.61	32,100	C.
May.	.....	.....	640	14.5	16.72	39,400	C.
June.	900	224	455	10.3	11.49	27,100	B.
July 1-20.	510	145	279	6.31	4.69	11,100	A.
The period.	.....	.....	.....	.....	.....	228,000	.....

NORTH FORK OF SKYKOMISH RIVER AT INDEX, WASH.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 17, T. 27 N., R. 10 E., at Index, $1\frac{1}{2}$ miles above mouth of river.

DRAINAGE AREA.—143 square miles.

RECORDS AVAILABLE.—August 24, 1910, to September 30, 1914.

GAGE.—Vertical staff installed November 24, 1911, on wing dam on right bank directly back of observer's house about one-third mile above highway bridge; original gage, a vertical staff on left bank about 50 feet above the tramway bridge, was used August 24 to September 2, 1910, and was destroyed in the course of improvement of channel; vertical staff on right bank about one-fourth mile above highway bridge at lower end of wing dam and about 300 feet below present gage was used October 26, 1910, to March 26, 1911.

DISCHARGE MEASUREMENTS.—Made from a cable 600 feet below the gage, or by wading.

CHANNEL AND CONTROL.—Gravel and large boulders; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.3 feet at 11 a. m. January 6 (discharge, 7,730 second-feet); minimum stage recorded, 0.68 foot at 7.30 a. m. September 7 (discharge, 156 second-feet).

1911-1914: Maximum stage recorded, 10.1 feet November 20, 1911 (discharge, 9,720 second-feet); minimum stage recorded, 1.5 feet September 8, 1911 (discharge, 110 second-feet).

WINTER FLOW.—Discharge relation not affected by ice.

ACCURACY.—Results good.

Discharge measurements of North Fork of Skykomish River at Index, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
Nov. 5	James F. Stewart.....	<i>Feet.</i> 2.18	<i>Sec.-ft.</i> 766	Apr. 22	Parker and Collier.....	<i>Feet.</i> 3.32	<i>Sec.-ft.</i> 1,410
Apr. 15	Parker and Collier.....	4.97	3,180	Aug. 24	I. L. Collier.....	.94	210

Daily discharge, in second-feet, of North Fork of Skykomish River at Index, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	273	505	1,020	313	515	1,500	515	885	2,170	1,650	348	180
2.....	254	430	955	281	515	1,350	538	2,170	2,370	1,500	348	180
3.....	254	405	780	281	470	1,080	610	2,570	1,900	1,500	348	180
4.....	273	430	780	3,440	427	945	1,210	1,990	1,650	1,420	313	170
5.....	254	725	725	4,320	386	770	1,810	1,570	1,350	1,080	313	160
6.....	218	955	670	7,290	348	825	1,650	1,570	1,080	945	313	160
7.....	455	955	615	4,210	348	885	1,500	1,650	945	945	313	156
8.....	505	1,080	615	2,780	330	885	1,500	1,650	1,650	945	313	202
9.....	725	1,080	560	1,810	297	825	1,570	1,650	1,350	885	297	281
10.....	725	1,280	505	1,500	313	770	1,650	1,650	1,210	945	297	214
11.....	7,180	895	560	1,280	297	770	1,570	1,730	1,350	945	281	226
12.....	4,800	615	560	1,010	313	945	1,420	1,810	1,500	945	281	226
13.....	2,790	588	560	885	313	1,080	1,730	2,370	1,500	945	281	226
14.....	1,960	588	615	825	348	2,370	2,470	2,780	2,080	825	281	885
15.....	1,620	560	560	825	330	1,730	3,330	2,780	2,470	770	281	1,650
16.....	1,210	5,080	505	825	330	1,990	2,570	2,470	2,270	715	266	945
17.....	1,080	2,460	455	770	348	1,810	1,570	2,080	1,990	715	252	770
18.....	955	1,480	480	660	330	1,810	1,500	1,810	1,650	715	239	1,350
19.....	955	1,340	382	635	386	1,730	2,780	1,810	1,500	715	226	1,900
20.....	1,020	1,140	359	562	635	1,650	2,470	2,270	1,420	610	239	1,650
21.....	1,080	1,080	359	515	825	1,900	1,730	2,170	1,420	470	239	1,140
22.....	955	955	337	562	825	1,990	1,500	2,670	1,500	427	226	1,080
23.....	955	1,620	315	492	825	2,170	1,420	2,370	1,350	427	226	825
24.....	895	3,500	359	448	825	2,270	1,210	1,990	1,210	427	214	770
25.....	895	1,960	315	448	2,570	1,210	1,210	1,900	1,210	427	214	715
26.....	725	1,780	294	515	1,500	945	1,210	1,810	1,210	406	214	715
27.....	670	1,550	315	470	1,350	825	1,280	1,730	1,350	348	202	715
28.....	505	1,410	273	448	1,500	660	1,080	1,500	1,350	330	202	610
29.....	615	1,210	254	427	.....	610	1,010	1,350	1,350	348	202	1,080
30.....	455	1,210	254	515	.....	586	1,080	1,350	1,730	348	214	448
31.....	480	.....	254	515	.....	562	.....	1,650	.....	348	198	.....

NOTE.—Discharge determined from a rating curve well defined between 150 and 2,000 second-feet.

Monthly discharge of North Fork of Skykomish River at Index, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 143 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	7,180	218	1,150	8.04	9.27	70,700	A.
November.....	5,080	405	1,300	9.09	10.14	77,400	A.
December.....	1,020	254	503	3.52	4.06	30,900	A.
January.....	7,290	281	1,290	9.02	10.40	79,300	A.
February.....	2,570	297	636	4.45	4.63	35,300	A.
March.....	2,370	562	1,270	8.88	10.24	78,100	A.
April.....	3,330	515	1,550	10.8	12.05	92,200	A.
May.....	2,780	885	1,930	13.5	15.56	119,000	A.
June.....	2,470	945	1,570	11.0	12.27	93,400	A.
July.....	1,650	330	775	5.42	6.25	47,700	A.
August.....	348	198	264	1.85	2.13	16,200	A.
September.....	1,900	156	660	4.62	5.16	39,300	A.
The year.....	7,290	156	1,080	7.55	102.16	780,000	

SOUTH FORK OF STILAGUAMISH RIVER NEAR SILVERTON, WASH.

LOCATION.—In SE. $\frac{1}{4}$ sec. 23, T. 30 N., R. 9 E., at the Silverton ranger station, about one-fourth mile below Martin Creek, $2\frac{1}{2}$ miles below Silverton post office, and about 5 miles above Gold Basin.

DRAINAGE AREA.—45.4 square miles.

RECORDS AVAILABLE.—September 1, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff spiked to overhanging hemlock.

DISCHARGE MEASUREMENTS.—Made from a cable 50 feet below gage, or by wading.

CHANNEL AND CONTROL.—Heavy boulders which will shift only during extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.4 feet at 11 a. m.

January 6 (discharge, 5,420 second-feet); minimum stage recorded, 0.80 foot at 6 p. m. September 4 (discharge, 35 second-feet).

1910-1914: Maximum stage recorded, 7 feet November 20, 1910 (discharge, 6,200 second-feet); minimum stage recorded 0.80 foot September 4, 1914 (discharge, 35 second-feet).

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS AND STORAGE.—None.

Discharge measurements of South Fork of Stilaguamish River near Silverton, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
Oct. 30	James E. Stewart.....	Feet.	Sec.-ft.
Apr. 25	Parker and Collier.....	1.30	126
		1.87	344

• Point of zero flow estimated at -0.5 foot ± 0.2 foot.

Daily discharge in second-feet of South Fork of Stilaguamish River near Silverton, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	126	155	155	225	1,710	.....	632	312	364	101	41
2.	126	155	155	188	890	.....	632	312	422	101	41
3.	126	155	206	155	486	.....	713	556	312	101	37
4.	188	155	4,380	188	364	.....	556	556	312	97	35
5.	225	188	4,040	155	312	.....	556	799	246	101	47
6.	225	713	5,290	126	275	.....	486	890	246	101	62
7.	266	422	2,160	126	312	.....	486	799	266	101	62
8.	312	364	1,710	126	364	.....	486	890	246	80	80
9.	312	364	799	101	422	.....	422	756	246	80	80
10.	266	312	312	155	364	.....	422	672	246	80	80
11.	266	312	521	126	312	.....	364	422	246	80	101
12.	225	312	486	155	312	556	364	422	246	80	126
13.	225	312	312	162	713	556	364	594	266	80	80
14.	266	312	225	155	1,710	556	338	672	266	80	1,080
15.	312	713	312	188	985	556	338	756	266	80	556
16.	422	2,280	486	188	1,710	632	312	556	266	80	266
17.	422	799	713	162	1,080	713	225	422	188	71	230
18.	422	.....	312	188	799	799	155	364	206	90	1,010
19.	312	.....	266	188	713	713	155	338	181	80	830
20.	312	.....	266	255	713	799	188	364	172	62	1,600
21.	266	.....	225	312	556	556	312	890	126	62	630
22.	266	.....	188	799	486	556	393	594	114	54	430
23.	225	.....	188	486	312	486	422	393	114	54	320
24.	225	.....	188	486	312	393	594	364	114	53	320
25.	225	.....	266	422	225	364	713	422	126	52	312
26.	188	.....	312	312	225	364	632	556	126	51	312
27.	155	.....	225	1,710	225	364	364	632	106	50	322
28.	155	.....	188	713	225	364	364	364	97	50	225
29.	126	.....	155	.....	195	393	354	354	90	47	312
30.	126	.....	266	.....	155	393	312	322	97	47	393
31.	126	.....	225	.....	155	.....	312	.....	101	47	.....

NOTE.—Discharge determined from a rating curve well defined below 500 second-feet. Gage not read and no discharge estimates made Nov. 18 to Dec. 31, and Apr. 1-11.

Monthly discharge of South Fork of Stilaguamish River near Silverton, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 45.4 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	422	126	240	5.29	6.10	14,800	B.
November 1-17.....	2,280	155	472	10.4	6.57	15,900	B.
January.....	5,290	155	843	18.6	21.44	51,800	B.
February.....	1,710	101	304	6.70	6.98	16,900	B.
March.....	1,710	155	569	12.5	14.41	35,000	B.
April 12-30.....	799	364	532	11.7	8.26	20,000	B.
May.....	713	155	418	9.21	10.62	25,700	B.
June.....	890	312	545	12.0	13.39	32,400	B.
July.....	422	90	207	4.56	5.26	12,700	B.
August.....	101	47	74.0	1.63	1.88	4,550	B.
September.....	.....	35	334	7.36	8.21	19,900	B.

SOUTH FORK OF STILAGUAMISH RIVER AT GRANITE FALLS, WASH.

LOCATION.—In sec. 12, T. 30 N., R. 6 E., 400 feet below mouth of Canyon Creek and about a mile north of town of Granite Falls, at the county highway bridge.

DRAINAGE AREA.—182 square miles.

RECORDS AVAILABLE.—June 19 to October 31, 1911; September 13, 1913, to September 30, 1914.

GAGE.—Chain attached to upstream handrail of bridge.

DISCHARGE MEASUREMENTS.—Made from bridge..

CHANNEL AND CONTROL.—One channel at all stages; control is composed of small boulders and probably shifts in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period covered by records, 11.05 feet at 8 a. m. January 6, 1914 (discharge, 11,700 second-feet); minimum stage recorded, 1.49 feet August 28–29 and September 3–4, 1914 (discharge, 136 second-feet).

ACCURACY.—Results fair.

Discharge measurements of South Fork of Stiloguamish River at Granite Falls, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
Oct. 27	James E. Stewart.....	<i>Feet.</i> 2.69	<i>Sec.-ft.</i> 579	Apr. 26	Parker and Collier.....	<i>Feet.</i> 3.52	<i>Sec.-ft.</i> 1,200
28	do.....	2.58	531	Sept. 26	I. L. Collier.....	3.22	993

Daily discharge, in second-feet, of South Fork of Stiloguamish River at Granite Falls, Wash., 1911, and 1913–14.

Day.	Oct.	Day.	Oct.	Day.	Oct.
1911.		1911.		1911.	
1.....	292	11.....	265	21.....	305
2.....	265	12.....	230	22.....	285
3.....	265	13.....	200	23.....	265
4.....	265	14.....	2,740	24.....	435
5.....	230	15.....	1,760	25.....	390
6.....	265	16.....	775	26.....	305
7.....	230	17.....	590	27.....	230
8.....	215	18.....	485	28.....	230
9.....	200	19.....	390	29.....	230
10.....	305	20.....	390	30.....	230
				31.....	170

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1913–14.													
1.....		354	790	2,430	898	935	5,350	1,080	1,320	1,400	935	279	160
2.....		334	568	2,310	860	898	2,560	972	1,080	1,240	935	262	157
3.....		375	465	1,670	935	860	1,870	2,560	3,250	1,240	935	231	136
4.....		418	720	1,400	7,600	720	1,870	2,080	1,490	898	720	231	136
5.....		375	2,690	1,160	7,600	655	1,400	2,830	1,400	826	625	216	162
6.....		315	2,970	1,080	10,400	625	1,400	1,670	1,160	755	625	246	157
7.....		825	1,580	1,160	7,450	655	1,400	1,490	1,240	595	625	315	175
8.....		1,240	1,490	1,320	3,700	540	1,490	1,490	1,320	6,700	655	262	246
9.....		1,080	1,580	1,080	1,770	568	1,240	1,670	1,320	2,430	595	216	297
10.....		1,400	2,830	1,770	1,580	540	1,240	1,580	1,400	1,490	568	216	262
11.....		9,250	1,320	898	2,080	1,160	1,010	1,490	1,400	1,240	595	202	860
12.....		2,970	1,080	1,770	2,190	1,080	1,240	1,240	1,320	1,400	568	202	418
13.....		216	6,700	825	1,320	1,160	1,490	3,250	1,580	1,320	514	246	279
14.....		465	2,690	720	1,160	2,080	1,080	4,300	1,970	1,010	720	202	2,430
15.....		442	2,310	720	1,490	1,970	1,080	2,310	1,240	1,010	625	202	1,240
16.....		419	1,770	6,850	1,320	2,080	935	1,970	1,870	1,320	540	202	935
17.....		396	1,240	2,560	825	1,970	935	2,080	1,770	1,160	568	202	595
18.....		375	1,080	1,770	688	972	1,160	2,080	1,770	1,030	489	202	2,560
19.....		441	1,240	1,670	825	898	1,010	1,870	3,110	972	860	175	2,080
20.....		375	1,080	1,400	688	825	1,160	1,870	2,430	1,080	972	188	4,000
21.....		334	972	1,160	568	860	2,560	1,580	1,970	1,080	1,240	375	1,580
22.....		972	860	2,080	375	1,240	3,250	1,580	1,490	1,240	1,870	334	1,080
23.....		465	720	3,110	489	1,080	1,970	1,400	1,240	1,240	315	162	790
24.....		441	1,080	10,000	418	860	1,770	1,670	1,400	1,240	1,580	315	152
25.....		418	790	3,110	514	825	1,490	1,240	1,080	1,320	1,490	297	162
26.....		354	655	2,560	489	2,430	1,240	1,240	1,240	1,010	1,080	334	175
27.....		410	595	2,430	568	1,080	3,700	1,010	1,490	1,580	1,080	246	1,770
28.....		465	514	1,770	297	825	2,430	1,010	1,320	1,010	297	136	860
29.....		489	489	2,310	540	972	.....	1,080	1,320	935	972	279	655
30.....		354	465	2,310	489	1,400	.....	1,160	1,240	935	935	231	145
31.....		418	.....	625	1,240	.....	.....	1,080	.....	1,080	.....	279	160

NOTE.—Discharge determined from a rating curve well defined between 400 and 2,000 second-feet. Discharge: July 13, 1913, 2,310 second-feet; July 14–17, 1913, 1,970 second-feet. June 5, discharge interpolated, owing to lack of gage reading.

Monthly discharge of South Fork of Stillaguamish River at Granite Falls, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 182 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	9,250	315	1,440	7.91	9.12	88,500	B.
November.....	10,000	465	2,180	12.0	13.39	130,000	B.
December.....	2,430	297	1,020	5.60	6.46	62,700	B.
January.....	10,400	825	2,350	12.9	14.87	144,000	B.
February.....	3,700	540	1,290	7.09	7.38	71,600	B.
March.....	5,350	1,010	1,740	9.56	11.02	107,000	B.
April.....	3,250	972	1,750	9.62	10.73	104,000	B.
May.....	3,250	935	1,310	7.20	8.30	80,600	B.
June.....	6,700	595	1,380	7.58	8.46	82,100	B.
July.....	935	231	522	2.87	3.31	32,100	B.
August.....	315	136	201	1.10	1.27	12,400	B.
September.....	4,000	136	888	4.88	5.44	52,800	B.
The year.....	10,400	136	1,340	7.36	99.75	968,000	

NOTE.—Mean discharge for October, 1911, 433 second-feet; run-off 26,600 acre-feet.

SKAGIT RIVER AT REFLECTOR BAR, NEAR MARBLEMOUNT, WASH.

LOCATION.—In sec. 8, T. 37 N., R. 13 E. Willamette meridian (unsurveyed), just below mouth of Canyon Diablo, at Reflector Bar ranger station, three-fourths mile above Stettattle Creek, 1½ miles below Thunder Creek, and 23 miles by trail northeast of Marblemount, in Whatcom County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 1, 1913, to September 30, 1914.

GAGE.—Stevens water stage recorder installed April 13, on right bank, 75 feet below mouth of Canyon Diablo, Henry Soll, observer. Inclined staff gage read twice a day to hundredths of a foot December 6–21, and once a day to hundredths of a foot December 22 to April 12. Datum of gage lowered 2.00 feet May 8 and all previous gage readings corrected to lower datum.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet below gage. Stay wire is used for measurements at high stages.

CHANNEL AND CONTROL.—Banks will not overflow; one channel at all stages. Control 200 feet below gage, composed of large boulders near right bank, clean gravel in center, and sand near left bank; may shift during floods. Zero flow would occur at gage height 0.00 ± 0.1 foot.

EXTREMES OF DISCHARGE.—Maximum stage December 6, 1913, to September 30, 1914, from recorder charts, 7.28 feet at 6.30 a. m. May 15 (discharge, 14,700 second-feet); minimum stage recorded, 2.19 feet at 8.30 a. m. February 17–20 (discharge, 1,080 second-feet).

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Gage-height record considered reliable; rating curve well defined throughout. From June 2 to September 15 considerable trouble was caused by clogging of intake to stilling well by silt; results prior to June 2 excellent; those thereafter fair.

Discharge measurements of Skagit River at Reflector Bar, near Marblemount, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Jan. 26	LaVille and Rohde.....	<i>Feet.</i> 2.79	<i>Sec.-ft.</i> 1,900	Aug. 26	Parker and Hoyt.....	<i>Feet.</i> 3.23	<i>Sec.-ft.</i> 2,580
May 8	Parker and Collier.....	4.90	6,400	Sept. 15	I. L. Collier.....	2.37	1,300
15	I. L. Collier.....	7.19	14,300				

Daily discharge, in second-feet, of Skagit River at Reflector Bar, near Marblemount, Wash., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	3,000	1,180	1,540	2,060	2,390	5,480	9,900	9,220	3,700	2,060
2.....	2,800	1,180	1,470	2,220	2,390	7,740	12,100	9,560	3,800	1,990
3.....	2,560	1,180	1,470	2,060	2,560	9,900	12,100	9,560	3,800	1,930
4.....	2,480	1,410	1,410	2,060	2,920	8,880	10,300	9,560	3,700	1,870
5.....	2,390	5,060	1,230	1,900	4,120	7,580	8,540	8,220	3,700	1,810
6.....	2,390	12,500	1,230	1,750	4,580	6,830	6,980	7,280	3,800	1,750
7.....	2,390	12,800	1,230	1,670	5,060	6,680	6,120	6,830	3,600	1,820
8.....	2,220	9,900	1,230	1,670	5,320	6,540	5,980	6,680	3,200	1,900
9.....	2,060	7,280	1,230	1,750	5,580	6,980	5,840	6,830	3,020	1,900
10.....	2,060	5,580	1,230	1,750	6,120	7,280	6,120	6,980	2,920	1,900
11.....	1,900	4,820	1,180	1,750	6,400	7,430	6,680	7,130	3,200	1,470
12.....	1,900	4,120	1,180	1,820	6,400	8,220	7,900	7,430	3,400	1,350
13.....	1,900	3,700	1,180	2,060	6,830	9,220	9,560	7,430	3,500	1,290
14.....	1,900	3,500	1,120	2,560	6,980	12,800	9,900	6,830	3,500	1,290
15.....	1,320	3,110	1,120	3,300	7,430	14,400	11,000	6,400	3,500	1,300
16.....	1,750	2,920	1,120	3,300	6,980	13,600	12,800	5,840	3,440	1,300
17.....	1,750	2,920	1,110	3,500	6,260	11,300	13,600	5,580	3,380	1,370
18.....	1,680	2,740	1,110	3,700	5,710	11,000	12,800	5,710	3,320	2,830
19.....	1,610	2,560	1,110	3,700	7,580	10,300	11,000	5,840	3,260	3,200
20.....	1,470	2,390	1,110	3,900	7,740	9,900	9,220	5,710	3,200	2,560
21.....	1,470	2,220	1,120	4,120	6,680	10,300	8,220	4,700	3,140	2,140
22.....	1,470	2,220	1,180	4,120	5,980	11,000	7,130	4,120	3,080	2,060
23.....	1,410	2,060	1,230	4,120	5,580	11,700	6,120	4,010	3,020	2,060
24.....	1,350	1,900	1,290	4,120	5,190	12,800	5,760	4,010	2,970	2,300
25.....	1,350	1,900	1,290	3,700	4,940	11,300	5,840	3,900	2,920	2,480
26.....	1,350	1,900	1,290	3,500	4,820	9,560	5,980	3,700	2,740	2,560
27.....	1,290	1,820	1,820	3,300	4,700	8,220	6,260	3,600	2,740	2,390
28.....	1,290	1,610	1,820	3,110	4,460	7,130	6,400	3,400	2,600	1,980
29.....	1,230	1,610	.....	2,920	4,230	6,400	6,830	3,320	2,460	1,840
30.....	1,210	1,680	.....	2,740	4,460	6,400	7,740	3,400	2,320	1,980
31.....	1,230	1,610	.....	2,560	.....	7,740	.....	3,500	2,190	.....

NOTE.—Discharge determined from a rating curve well defined below 15,000 second-feet. Estimated Dec. 1-5 as in table, by comparison with Skagit River near Marblemount. Interpolated because of lack of gage readings Aug. 16-24, 28-31, Sept. 2-5, 7, and 9.

Monthly discharge of Skagit River at Reflector Bar, near Marblemount, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.*			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
December.....	3,000	1,210	1,830	113,000	A.
January.....	12,800	1,180	3,590	221,000	A.
February.....	1,820	1,110	1,270	70,500	A.
March.....	4,120	1,670	2,800	172,000	A.
April.....	7,740	2,390	5,350	318,000	A.
May.....	14,400	5,480	9,180	564,000	A.
June.....	13,600	5,760	8,490	505,000	B.
July.....	9,560	3,320	6,010	370,000	B.
August.....	3,800	2,190	3,200	197,000	B.
September.....	3,200	1,290	1,960	117,000	B.
The period.....	.....	.....	.....	2,650,000	.....

SKAGIT RIVER NEAR MARBLEMOUNT, WASH.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 21, T. 37 N., R. 12 E., at the proposed power-house site of the Skagit Power Co., 1 mile above Goodell Creek, $6\frac{1}{2}$ miles below Stetattle Creek, and about 16 miles above Marblemount.

DRAINAGE AREA.—1,090 square miles.

RECORDS AVAILABLE.—December 21, 1908, to May 23, 1914, when station was discontinued.

GAGE.—Vertical staff on right bank.

DISCHARGE MEASUREMENTS.—Made from a cable at the gage.

CHANNEL AND CONTROL.—Heavy boulders; shifting in extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.8 feet at 4 p. m.

January 6 (discharge, 18,000 second-feet); minimum stage recorded, 1.38 feet at 7.45 a. m. and 4 p. m. January 2, at 7.30 a. m. February 17, and at 7 a. m. February 19 (discharge, 1,220 second-feet).

1909-1914: Maximum stage recorded, 22.0 feet during early morning of November 29, 1909, determined from flood marks (approximate discharge, 83,000 second-feet); minimum stage recorded, 0.80 foot at 8.15 a. m. February 6 and 8, 1913 (discharge, 820 second-feet). Minimum discharge October 1, 1913, to May 23, 1914, differs from that recorded in daily-discharge table because gage heights were used to tenths of feet in computations.

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Results good.

Discharge measurements of Skagit River near Marblemount, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 14	Stewart and Laville....	4.34	4,770	May 14	I. L. Collier.....	9.09	15,600
Jan. 22	Laville and Emery.....	2.46	2,420	Aug. 27	Hoyt and Parker.....	2.88	<i>a</i> 2,770
May 6	Parker and Collier.....	5.76	7,000	Sept. 16	I. L. Collier.....	1.51	<i>b</i> 1,360
7	.....do.....	5.71	7,020				

a Measurement made at Reflector Bar, 7 miles above, and inflow between estimated at 100 second-feet.

b Measurement made at Reflector Bar, and intervening flow estimated at 85 second-feet.

Daily discharge, in second-feet, of Skagit River near Marblemount, Wash., from Oct. 1, 1913, to May 28, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1.....	1,890	2,210	3,150	1,240	1,790	2,430	2,540	5,810
2.....	1,990	1,990	2,900	1,240	1,560	2,540	2,430	8,640
3.....	1,790	1,890	2,660	1,240	1,560	2,320	2,660	11,400
4.....	1,590	1,890	2,540	2,210	1,500	2,210	3,410	8,580
5.....	1,500	1,990	2,430	6,500	1,410	1,990	4,550	8,000
6.....	1,410	2,430	2,320	17,700	1,320	1,890	5,160	7,220
7.....	1,410	2,210	2,320	14,800	1,410	1,890	5,640	7,040
8.....	1,320	2,210	2,210	10,800	1,410	1,890	5,980	6,860
9.....	1,320	2,320	2,100	7,600	1,320	1,990	6,320	7,400
10.....	1,410	2,430	1,990	5,980	1,320	1,890	6,680	7,800
11.....	5,640	2,320	1,990	4,850	1,320	1,890	7,040	7,800
12.....	5,640	2,100	1,990	4,400	1,320	1,990	6,860	8,640
13.....	6,860	1,990	1,890	3,960	1,320	2,430	7,220	10,100
14.....	4,850	1,890	1,890	3,540	1,240	3,680	7,400	14,500
15.....	4,100	1,990	1,890	3,280	1,240	3,680	8,420	16,700
16.....	3,410	6,320	1,790	3,280	1,240	3,680	7,600	15,160
17.....	3,020	4,850	1,790	2,900	1,240	3,960	6,680	12,800
18.....	2,900	3,820	1,690	2,780	1,240	4,100	5,980	11,700
19.....	3,020	3,410	1,690	2,540	1,240	4,100	8,200	10,900
20.....	3,020	2,900	1,590	2,430	1,240	4,250	8,420	10,900
21.....	2,900	2,660	1,500	2,320	1,320	4,550	7,220	11,100
22.....	2,780	2,660	1,410	2,210	1,410	4,550	6,500	12,500
23.....	3,020	2,540	1,410	2,100	1,410	4,400	5,980	13,600
24.....	3,680	5,980	1,410	1,990	1,500	5,000	5,480	.....
25.....	3,150	5,000	1,410	1,990	1,500	3,960	5,160	.....
26.....	2,900	4,550	1,320	1,990	1,500	3,540	5,000	.....
27.....	2,660	4,250	1,320	1,890	2,210	3,280	4,850	.....
28.....	2,430	3,820	1,320	1,790	1,990	3,020	4,700	.....
29.....	2,320	3,680	1,240	1,790	.....	2,900	4,400	.....
30.....	2,210	3,410	1,240	1,790	.....	2,780	4,550	.....
31.....	2,210	.....	1,240	1,790	.....	2,660	.....	.....

NOTE.—Discharge determined from rating curve well defined between 1,200 and 15,000 second-feet.

Monthly discharge of Skagit River near Marblemount, Wash., for the period Oct. 1, 1913, to May 23, 1914.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	6,860	1,320	2,850	2.61	3.01	175,000	A.
November.....	6,320	1,890	3,060	2.81	3.14	182,000	A.
December.....	3,150	1,240	1,860	1.71	1.97	114,000	A.
January.....	17,700	1,240	4,020	3.69	4.25	247,000	A.
February.....	2,210	1,240	1,430	1.31	1.36	79,409	A.
March.....	5,000	1,890	3,080	2.83	3.26	189,000	A.
April.....	8,420	2,430	5,770	5.29	5.90	343,000	A.
May 1-23.....	16,700	5,810	10,300	9.45	8.08	470,000	A.
The period.....	.....	.....	.....	.....	.....	1,800,000	.....

SKAGIT RIVER NEAR SEDRO WOOLLEY, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 36, T. 35 N., R. 4 E., at the Northern Pacific Railway bridge just above Sterling Bend, $1\frac{1}{2}$ miles south of Sedro Woolley, and about 25 miles above the mouth.

DRAINAGE AREA.—2,930 square miles.

RECORDS AVAILABLE.—May 1, 1908, to September 30, 1914.

GAGE.—Vertical staff on cribbing 100 feet above draw-span pier.

DISCHARGE MEASUREMENTS.—Made from a highway bridge about one-third mile above the railway bridge.

CHANNEL AND CONTROL.—Gravel; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 49.6 feet at 4 a. m.

January 7 (discharge, 75,000 second-feet); minimum stage recorded, 33.9 feet at 8 a. m. December 30–31 (discharge, 5,240 second-feet).

1908–1914: Maximum stage recorded, 56.1 feet November 30, 1909 (discharge, 96,100 second-feet); minimum stage recorded, 35.4 feet November 2–3, 1911 (discharge, 3,250 second-feet).

ACCURACY.—Results good during periods of frequent measurements, but may be considerably in error at other times.

Discharge measurements of Skagit River near Sedro Woolley, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
Oct. 6	James E. Stewart.....	<i>Feet.</i> 34.13	<i>Sec.-ft.</i> 5,820	May 4	Parker and Collier.....	<i>Feet.</i> 39.60	<i>Sec.-ft.</i> 26,700
19	.....do.....	36.50	13,500	Sept. 23	I. L. Collier.....	35.18	9,580

Daily discharge, in second-feet, of Skagit River near Sedro Woolley, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	6,800	8,540	18,000	5,480	10,600	21,000	10,300	15,100	24,400	26,700	12,300	8,070
2.....	6,800	8,240	15,700	5,480	9,300	21,400	9,620	19,700	30,800	30,300	13,300	7,480
3.....	6,800	7,360	13,800	5,740	8,680	15,800	10,300	29,400	34,900	30,300	12,600	7,480
4.....	6,520	7,080	12,400	8,240	8,370	14,000	13,700	29,400	30,800	30,800	12,300	7,190
5.....	5,740	8,540	11,700	45,400	7,770	12,600	21,400	24,000	24,000	26,200	12,000	6,910
6.....	5,480	11,400	10,700	60,700	6,910	10,900	22,700	20,500	23,700	22,700	12,000	6,110
7.....	5,480	13,500	11,000	75,000	6,630	10,300	20,100	20,100	17,700	21,000	12,600	6,110
8.....	5,480	10,700	10,400	61,000	6,370	10,300	18,900	19,700	18,100	20,500	11,300	7,480
9.....	5,740	11,700	9,740	38,800	6,370	10,900	19,300	20,100	16,900	21,000	10,600	8,370
10.....	5,480	16,800	8,540	29,400	6,110	10,600	20,500	20,500	15,400	21,000	9,940	7,190
11.....	32,700	13,800	8,240	24,900	6,630	9,940	20,100	21,000	15,400	21,800	10,300	6,630
12.....	42,400	11,400	8,840	21,000	6,630	9,620	19,700	21,800	16,900	22,200	10,900	7,480
13.....	36,000	9,740	8,840	18,100	6,910	10,600	19,300	24,000	19,700	23,100	11,300	6,370
14.....	33,600	8,540	8,540	16,600	6,910	19,300	24,400	29,900	22,200	21,800	11,300	5,860
15.....	22,100	7,940	9,440	15,800	6,630	23,100	29,000	38,800	27,100	19,700	10,900	8,070
16.....	18,000	22,500	8,240	15,800	6,630	18,500	29,400	35,900	33,100	19,700	10,900	8,770
17.....	14,900	30,400	7,640	15,100	6,910	23,100	23,100	31,300	36,800	17,700	10,300	6,910
18.....	13,100	20,000	7,360	14,400	6,630	20,100	19,700	28,000	34,000	18,900	8,990	10,300
19.....	12,400	16,100	7,080	13,300	6,630	18,500	21,800	26,700	30,300	18,900	8,990	19,700
20.....	13,500	14,600	6,800	12,000	7,480	17,700	33,100	26,200	26,200	19,700	9,300	20,500
21.....	12,800	12,800	6,520	11,300	7,770	18,100	26,200	27,100	23,600	17,300	9,620	15,400
22.....	12,000	11,700	6,260	10,900	11,300	17,700	21,800	29,900	23,100	14,000	9,940	11,600
23.....	11,000	11,700	6,000	10,300	10,900	16,600	19,700	31,700	18,900	13,700	8,990	9,620
24.....	13,100	44,400	5,740	9,300	10,900	15,800	18,500	33,600	16,900	13,000	8,680	8,990
25.....	14,600	38,400	5,480	8,990	10,900	15,100	16,900	30,800	17,700	13,000	8,990	8,990
26.....	11,700	32,700	5,480	9,620	9,940	14,000	15,800	28,000	17,700	13,000	8,990	8,990
27.....	13,800	23,300	5,480	10,600	13,700	12,600	15,800	24,000	17,700	13,000	8,680	13,300
28.....	12,800	21,200	5,480	9,300	14,000	11,600	15,800	22,200	19,300	12,300	8,990	11,300
29.....	8,540	20,000	5,480	8,990	.....	9,300	14,400	18,900	19,700	11,600	8,680	8,990
30.....	8,240	21,200	5,240	8,990	.....	10,900	14,000	17,700	23,100	11,600	8,680	8,370
31.....	7,640	.....	5,240	9,620	.....	10,600	.....	18,900	.....	12,000	8,990	.....

NOTE.—Discharge determined from rating curves fairly well defined between 4,000 and 40,000 second-feet applicable Oct. 1 to Jan. 7 and Jan. 8 to Sept. 30.

Monthly discharge of Skagit River near Sedro Woolley, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 2,930 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	42,400	5,480	13,700	4.68	5.40	842,000	A.
November.....	44,400	7,080	16,500	5.63	6.28	982,000	B.
December.....	18,000	5,240	8,560	2.92	3.37	526,000	B.
January.....	75,000	5,480	19,700	6.72	7.75	1,210,000	B.
February.....	14,000	6,110	8,380	2.86	2.98	465,000	B.
March.....	23,100	9,300	14,900	5.09	5.87	916,000	B.
April.....	29,400	9,620	19,500	6.66	7.43	1,160,000	B.
May.....	38,800	15,100	25,300	8.63	9.95	1,560,000	B.
June.....	36,800	15,400	23,100	7.88	8.79	1,370,000	B.
July.....	30,800	11,600	19,300	6.59	7.60	1,190,000	B.
August.....	13,300	8,680	10,400	3.55	4.09	640,000	B.
September.....	20,500	5,860	9,250	3.16	3.53	550,000	B.
The year.....	75,000	5,240	15,800	5.39	73.04	11,400,000	

STETATTLE CREEK NEAR MARBLEMOUNT, WASH.

LOCATION.—In sec. 6, T. 37 N., R. 13 E., Willamette meridian (unsurveyed), below all tributaries, above Skagit Trail bridge, a quarter of a mile above mouth, and 22½ miles by trail northeast of Marblemount, in Whatcom County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 19, 1913, to September 30, 1914.

GAGE.—Vertical staff on left bank, 600 feet above Skagit Trail bridge, read to hundredths of a foot once each day for which record is published, by Henry Soll.

DISCHARGE MEASUREMENTS.—Made from cable or by wading; stay wire is used for measurements at high stages.

CHANNEL AND CONTROL.—Banks will not overflow; one channel at all stages. Control, 75 feet below gage, composed of heavy angular boulders, is probably permanent. Zero flow would occur at gage height of -0.1 ± 0.2 foot.

EXTREMES OF DISCHARGE.—Maximum stage recorded December 19, 1913, to September 30, 1914, 5.4 feet at 8 a. m. January 6 (discharge, 1,800 second-feet); minimum stage recorded, 1.01 foot at 8 a. m. February 11–12 (discharge, 23.6 second-feet). Minimum differs from that shown in daily discharge table because gage heights were used to half-tenths of feet in computing daily discharge.

WINTER FLOW.—Discharge relation not seriously affected by ice; open channel rating curve assumed applicable except for February 5 when discharge was interpolated.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Gage-height record considered reliable, rating curve is well defined between 35 and 600 second-feet; considerable diurnal fluctuation April to June. Results good, but record is too fragmentary for monthly estimate from April to September.

Discharge measurements of Stetattle Creek near Marblemount, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
May 9	Parker and Collier.....	<i>Fect.</i> 2.45	<i>Sec.-ft.</i> 248	Aug. 26	Hoyt and Parker.....	<i>Fect.</i> 1.74	<i>Sec.-ft.</i> 88.5
15	I. L. Collier.....	3.01	489	Sept. 15	I. L. Collier.....	1.60	73.4

Daily discharge, in second-feet, of Stetattle Creek near Marblemount, Wash., from Dec. 19, 1913, to Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.		36	44	140				340		72
2.		33	36	120					140	
3.		36	32	90		483				
4.		104	32	78			231			
5.		700	30	67						
6.		1,800	29	58						
7.		1,420	26	58		384		201		
8.		384	26	62		264				96
9.		201	23	72		248				
10.		120	23	67						
11.		90	23	62			264			
12.		78	23	67				300		
13.		67	23	120		362				
14.		62	26	362		700				53
15.		62	26	248		483				72
16.		62	26	362			432			67
17.		62	29	216						
18.		58	29	216						
19.	53	53	32	188						
20.	48	44	36	201	362			201		174
21.	44	44	36	188						
22.	44	44	58	150						
23.	40	40	53	129						96
24.	36	36	62	104		1,030				90
25.	36	36	58	90			174		90	
26.	32	44	48	78						
27.	30	53	120	72				120	90	
28.	30	40	83	62					83	
29.	30	40		62						
30.	32	44		62						72
31.	36	44		55		248				

NOTE.—Discharge determined from rating curve well defined between 40 and 600 second-feet. Discharge relation affected by ice Feb. 5; discharge interpolated.

Monthly discharge of Stetattle Creek near Marblemount, Wash., for period Dec. 19, 1913, to Mar. 31, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
December 19-31.	53	30	37.8	974	B.
January.	1,800	33	192	11,800	B.
February.	120	23	39.0	2,170	B.
March.	362	55	126	7,750	A.
The period.				22,700	

BAKER LAKE NEAR CONCRETE, WASH.

LOCATION.—At United States fish hatchery on Baker Lake, 17½ miles above Concrete.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 2, 1910, to September 30, 1914.

GAGE.—Vertical staff in two sections.

EXTREMES OF STAGE.—Maximum stage recorded during year and also for period 1910-1914, 14.0 feet at 7.30 a. m. January 6; minimum stage recorded, 0.6 foot February 3-28.

WINTER FLOW.—Ice occasionally forms in lake during winter.

COOPERATION.—Gage-height record furnished by the United States Bureau of Fisheries.

Daily gage height, in feet, of Baker Lake near Concrete, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	2.1	4.0	3.8	2.0	1.0	1.0	2.5	2.9	4.5	4.5	3.1	1.8
2.....	2.1	4.2	3.5	2.0	.8	1.0	2.5	4.0	5.5	4.6	3.1	1.8
3.....	2.1	3.8	3.1	2.0	.6	1.0	2.5	4.8	5.0	5.4	3.1	1.8
4.....	2.0	3.5	3.0	3.5	.6	.8	2.8	4.4	4.1	5.5	3.1	1.8
5.....	1.8	3.5	2.7	10.3	.6	.7	4.1	3.6	3.8	5.0	3.1	1.8
6.....	1.5	3.5	2.5	14.0	.6	.7	4.0	3.5	3.3	4.5	3.1	1.8
7.....	1.5	3.5	2.8	10.0	.6	1.0	3.7	3.0	3.0	4.0	3.1	1.8
8.....	1.5	3.5	2.6	6.0	.6	1.4	3.5	3.2	2.9	4.3	2.8	1.5
9.....	1.5	4.5	2.5	5.5	.6	1.6	3.4	3.6	2.8	4.5	2.6	1.4
10.....	1.5	5.0	2.5	4.0	.6	1.8	3.5	3.6	2.7	4.5	2.6	1.4
11.....	6.8	4.2	2.4	3.2	.6	1.9	3.5	3.6	3.0	4.5	2.8	1.4
12.....	10.2	3.5	2.4	2.6	.6	1.9	3.5	3.7	3.5	4.7	2.8	1.4
13.....	10.5	3.2	2.4	2.5	.6	1.9	3.5	4.1	3.5	4.8	3.0	1.6
14.....	6.7	3.0	2.6	2.4	.6	2.0	4.1	5.4	3.6	4.4	3.0	1.8
15.....	5.0	3.0	2.8	2.2	.6	4.1	5.1	6.2	4.5	4.1	3.0	1.8
16.....	4.8	7.5	2.5	2.0	.6	3.4	4.8	5.1	5.0	4.0	3.0	2.4
17.....	4.0	6.0	2.5	2.0	.6	3.3	3.5	5.4	6.2	4.0	3.4	2.6
18.....	3.2	5.8	2.5	2.0	.6	3.5	3.5	5.0	5.5	4.2	3.4	6.4
19.....	3.2	5.4	2.3	2.0	.6	3.4	3.5	4.8	4.8	4.5	2.5	7.7
20.....	3.5	4.0	2.2	2.0	.6	3.4	5.8	4.4	4.1	4.3	2.6	6.4
21.....	3.2	3.8	1.9	1.7	.6	3.4	4.1	4.0	4.0	3.4	2.9	5.8
22.....	3.2	3.5	1.9	1.6	.6	3.3	3.3	5.5	4.0	3.3	2.7	4.9
23.....	3.5	3.5	1.9	1.6	.6	3.2	3.0	5.4	3.2	3.4	2.5	4.8
24.....	4.0	9.0	1.9	1.4	.6	3.0	2.8	5.1	3.0	3.0	2.5	4.7
25.....	3.8	7.0	1.9	1.2	.6	3.0	2.7	4.9	3.3	3.0	2.6	4.6
26.....	3.5	5.5	1.9	1.0	.6	2.8	2.5	4.3	3.5	2.9	2.7	4.4
27.....	3.0	5.0	2.0	1.0	.6	2.6	2.5	4.0	3.8	2.9	2.6	4.9
28.....	2.8	4.5	2.0	1.0	.6	1.9	2.5	3.6	3.9	2.8	2.7	5.2
29.....	2.5	4.3	2.0	1.0	.....	1.9	2.3	3.2	4.1	2.6	2.6	5.0
30.....	2.5	4.0	2.0	1.0	.....	2.0	2.3	3.0	4.5	2.6	2.5	4.8
31.....	2.5	.....	2.0	1.0	.....	2.4	.....	3.5	.....	3.1	2.4	.....

BAKER RIVER BELOW ANDERSON CREEK, NEAR CONCRETE, WASH.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 30, T. 37 N., R. 9 E., 100 feet below Anderson Creek, one-fourth mile above the Baker River ranger station, and 11 miles above Concrete.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—September 10, 1910, to September 30, 1914.

GAGE.—Vertical and inclined staffs on left bank October 22, 1910, to September 4, 1913; since September 21, 1913, an inclined and two vertical sections at practically the same site as the gages previously used but at different datum. From September 10 to March 19, 1910, a vertical staff at trail bridge one-eighth mile above Anderson Creek. Readings on this gage have been reduced to datum of gage installed October 22, 1910, by means of a relation curve.

DISCHARGE MEASUREMENTS.—Made from a cable 300 feet above the gage.

CHANNEL AND CONTROL.—Gravel; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.6 feet at 3 p. m. January 6 (discharge, approximately 22,700 second-feet); minimum stage recorded, 2.35 feet October 4 (discharge, 431 second-feet). Maximum gage height given does not represent average water level on account of large eddy at high-water section of gage. Gage height 10.6 feet, used for computing discharge, is based on comparative readings on upper and lower sections of gage between 8.3 and 9.1 feet.

1910-1914: Maximum stage recorded, 18.7 feet November 20, 1910, estimated height of water at trail bridge across canyon at location of original gage (discharge not computed); minimum stage recorded, 2.6 feet February 27 and March 1, 1911 (discharge, 410 second-feet).

ACCURACY.—Results good.

Discharge measurements of Baker River below Anderson Creek, near Concrete, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Oct. 8	James E. Stewart.....	<i>Feet.</i> 3.06	<i>Sec.-ft.</i> 731	May 12	I. L. Collier.....	<i>Feet.</i> 5.06	<i>Sec.-ft.</i> 2,580
11	do.....	7.15	7,360	12	do.....	5.05	2,590
12	do.....	6.88	6,400	Sept. 21	do.....	4.75	2,250

Daily discharge, in second-feet, of Baker River below Anderson Creek, near Concrete, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	554	-----	1,910	1,080	980	1,600	1,440	2,950	3,670	3,480	1,710	1,350
2.....	577	1,120	-----	975	960	1,620	1,520	3,120	-----	4,260	-----	-----
3.....	490	1,190	1,810	975	910	1,440	1,620	2,130	3,480	3,860	-----	1,190
4.....	431	-----	-----	4,700	847	1,270	1,620	1,910	2,370	3,670	1,810	1,040
5.....	-----	1,270	-----	10,300	787	1,270	1,800	2,020	2,130	2,650	1,810	1,040
6.....	-----	1,440	-----	22,700	787	1,210	1,710	2,130	1,910	2,500	1,810	-----
7.....	-----	1,520	-----	6,860	787	1,120	1,710	-----	1,710	2,640	-----	-----
8.....	787	-----	1,440	4,700	847	1,360	1,710	2,130	-----	2,850	1,440	1,190
9.....	-----	1,520	1,270	3,120	847	1,320	2,020	-----	-----	2,920	-----	1,190
10.....	-----	2,250	1,270	2,370	847	1,270	2,250	2,250	-----	3,120	1,520	1,190
11.....	7,480	-----	1,190	2,250	847	1,440	2,020	2,640	-----	3,300	1,620	1,040
12.....	6,560	2,020	1,190	1,710	847	1,440	1,780	3,120	2,250	3,120	1,910	-----
13.....	5,700	-----	1,120	1,660	787	1,480	2,000	3,120	-----	3,120	1,910	975
14.....	3,300	-----	1,040	1,620	787	3,480	2,370	-----	-----	2,640	1,810	1,120
15.....	-----	-----	-----	1,520	730	2,500	4,260	-----	4,700	2,640	1,910	1,190
16.....	2,500	-----	975	1,520	730	2,250	2,950	-----	5,180	2,500	-----	1,040
17.....	-----	-----	975	1,440	730	2,020	2,500	-----	-----	2,680	-----	1,620
18.....	-----	-----	975	1,400	787	1,810	2,130	2,790	4,260	3,120	1,440	5,180
19.....	-----	-----	-----	1,350	847	1,790	2,250	3,120	3,860	3,300	1,520	4,480
20.....	-----	-----	910	1,190	847	1,740	2,020	3,670	-----	2,500	1,710	3,120
21.....	1,040	-----	-----	1,120	975	1,620	1,910	-----	-----	1,910	-----	2,020
22.....	1,270	-----	910	1,120	1,120	1,520	1,620	-----	-----	1,710	-----	1,710
23.....	1,810	-----	847	1,040	1,270	1,520	1,770	-----	-----	1,710	-----	1,520
24.....	1,710	8,460	730	1,010	1,270	1,440	1,520	-----	1,710	1,810	-----	-----
25.....	-----	4,700	730	975	1,350	1,440	1,520	3,300	1,910	1,710	-----	1,440
26.....	1,440	3,480	730	910	1,270	1,440	1,620	-----	-----	1,620	-----	1,350
27.....	1,270	2,250	910	910	1,620	1,270	1,440	3,120	1,910	1,520	-----	-----
28.....	1,040	2,020	847	847	1,520	1,270	1,350	3,120	2,500	1,440	1,440	-----
29.....	975	2,020	847	910	-----	1,190	1,270	-----	2,790	1,620	1,440	1,440
30.....	975	1,910	847	1,000	-----	1,190	1,270	3,300	3,670	1,810	-----	1,350
31.....	1,270	-----	910	1,040	-----	1,120	-----	-----	-----	-----	1,350	-----

NOTE.—Discharge determined from a rating curve well defined between 700 and 8,000 second-feet. Discharge estimated, owing to lack of gage readings, from hydrographic comparison with record of Baker River at Concrete, Wash., for the following periods: Jan. 1 and 30; Feb. 1 and 2; Mar. 1, 6-9, 13, 19, and 20; Apr. 5, 8, 12, 13, and 23; July 5, 8, 9, 11, 17, 23, and 26. Discharge interpolated, owing to lack of gage readings, Jan. 13, 18, 24, and Mar. 3. Discharge Jan. 5-7 may be small due to reading on vertical gage not being applicable to rating on inclined gage.

Monthly discharge of Baker River below Anderson Creek, near Concrete, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 184 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January.....	22,700	847	2,720	14.8	17.06	167,000	C.
February.....	1,620	730	962	5.23	5.45	53,400	B.
March.....	3,480	1,120	1,560	8.48	9.78	95,900	C.
April.....	4,260	1,270	1,900	10.3	11.49	113,000	C.
July.....	4,260	1,440	2,590	14.1	15.73	154,000	C.

BAKER RIVER AT CONCRETE, WASH.

LOCATION.—In sec. 11, T. 35 N., R. 8 E., at highway bridge at Concrete, one-fourth mile above mouth.

DRAINAGE AREA.—270 square miles.

RECORDS AVAILABLE.—September 11, 1910, to September 30, 1914.

GAGE.—Inclined and vertical staff on left bank 150 feet below bridge.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge; conditions very unfavorable.

CHANNEL AND CONTROL.—Loose sand, gravel, and small bowlders; shifting frequently; one channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.5 feet at 1 p. m. January 6 (discharge, 24,500 second-feet); minimum stage recorded, 2.18 feet, at 1 p. m. February 10 (discharge, 682 second-feet); this estimate differs from that given in the table of daily discharge, as gage height was used to nearest tenth of a foot in computing.

1910-1914: Maximum stage recorded, 11.5 feet at 1 p. m. January 6, 1914 (discharge, 24,500 second-feet); minimum stage recorded, 2.18 feet at 1 p. m., January 22 and 23, 1913 (discharge, 634 second-feet).

WINTER FLOW.—Discharge relation not affected by ice

DIVERSIONS.—None.

STORAGE.—Natural, in Baker Lake.

ACCURACY.—Results only fair, because of poor measuring conditions, shifting channel, and diurnal fluctuation.

Discharge measurements of Baker River at Concrete, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Oct. 6	James E. Stewart.....	<i>Feet.</i> 2.26	<i>Sec.-ft.</i> 755	May 13	I. L. Collier.....	<i>Feet.</i> 4.28	<i>Sec.-ft.</i> 3,480
12	.....do.....	7.65	12,100	Sept. 17	.....do.....	2.63	1,340
Jan. 20	LaVille and Pulos.....	3.04	1,540	22	.....do.....	3.22	2,210
May 11	I. L. Collier.....	3.83	2,770	22	.....do.....	3.12	2,000

Daily discharge, in second-feet, of Baker River at Concrete, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,050	1,390	3,030	1,240	1,190	3,030	1,310	2,430	3,690	4,070	2,300	1,220
2.....	1,100	1,240	1,850	1,000	1,050	3,030	1,500	3,170	3,690	4,070	2,170	1,220
3.....	920	1,500	1,610	1,000	1,000	2,380	1,820	4,070	4,270	3,510	2,050	1,130
4.....	802	1,850	1,390	1,980	920	1,850	2,570	3,010	3,690	3,340	2,050	1,050
5.....	730	1,850	1,240	13,900	802	1,500	3,690	2,570	3,510	2,860	1,930	1,050
6.....	765	2,690	1,240	23,900	765	1,390	3,010	2,300	3,340	2,710	1,930	1,050
7.....	765	2,860	1,290	13,000	730	1,290	3,010	2,430	1,820	3,170	1,820	1,220
8.....	730	3,030	1,240	7,150	695	1,500	3,010	2,430	2,170	2,860	1,710	1,400
9.....	765	3,390	1,100	4,380	695	1,390	2,710	2,570	1,930	3,010	1,600	1,310
10.....	1,390	2,860	1,100	3,210	695	1,340	2,710	4,490	1,820	3,010	1,710	1,220
11.....	15,200	2,110	1,500	2,690	765	1,190	2,710	2,710	1,930	3,510	1,930	1,130
12.....	9,500	1,610	1,290	2,240	730	1,290	2,570	3,010	2,170	3,340	1,930	1,130
13.....	13,000	1,390	1,240	1,980	765	1,340	3,340	3,340	2,860	2,170	2,050	970
14.....	4,830	1,190	1,390	1,980	802	5,070	3,690	5,430	3,170	3,010	2,050	1,400
15.....	3,390	1,390	1,290	2,530	765	4,490	4,490	5,190	4,270	2,860	1,930	1,310
16.....	2,530	6,870	1,190	2,380	802	4,490	3,340	3,690	4,710	2,860	1,600	1,220
17.....	2,380	3,580	1,140	2,110	840	3,880	2,710	3,340	4,490	2,860	1,500	1,310
18.....	1,850	2,380	962	1,850	840	3,010	2,710	3,010	3,880	3,170	1,500	4,490
19.....	1,850	2,110	920	1,610	840	3,010	5,190	3,170	3,340	3,010	1,500	4,490
20.....	1,850	1,730	880	1,390	920	3,010	4,270	3,880	2,570	2,860	1,600	3,710
21.....	1,850	1,500	880	1,390	962	2,860	3,010	4,070	2,570	2,170	1,820	2,640
22.....	1,850	1,610	840	1,290	1,610	2,710	2,860	3,880	2,170	2,170	1,600	2,130
23.....	1,850	1,850	802	1,000	1,390	2,430	2,710	3,880	1,930	2,170	1,500	1,890
24.....	2,240	12,700	765	1,000	1,610	2,170	2,570	3,880	2,170	1,930	1,500	1,780
25.....	2,860	5,070	695	1,000	1,500	2,050	1,930	3,690	2,300	2,050	1,500	1,780
26.....	2,110	4,170	695	1,390	1,610	1,710	1,930	3,170	2,300	1,930	1,500	1,780
27.....	1,340	3,970	880	1,190	2,240	1,600	1,930	3,170	2,430	1,820	1,500	2,510
28.....	1,100	2,860	802	1,000	1,850	1,500	1,500	2,430	2,710	1,710	1,500	2,250
29.....	962	5,070	840	1,000	-----	1,500	1,600	2,170	3,010	1,820	1,500	1,890
30.....	840	3,970	880	1,290	-----	1,400	1,710	2,170	3,510	1,930	1,500	1,670
31.....	1,000	-----	920	1,290	-----	1,310	-----	2,860	-----	2,050	1,400	-----

NOTE.—Discharge determined as follows: Oct. 1 to Mar. 14 from a fairly well-defined rating curve; Mar. 15 to Sept. 19 from a rating curve well defined between 1,150 and 4,000 second-feet; Sept. 20-30 from a rating curve well defined between 900 and 3,000 second-feet.

Monthly discharge of Baker River at Concrete, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 270 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	15,200	730	2,690	9.96	11.48	165,000	A.
November.....	12,700	1,190	2,990	11.1	12.38	178,000	A.
December.....	3,030	695	1,160	4.30	4.96	71,300	A.
January.....	23,900	1,000	3,370	12.5	14.41	207,000	B.
February.....	2,240	695	1,050	3.89	4.05	58,300	B.
March.....	5,070	1,190	2,280	8.44	9.73	140,000	B.
April.....	5,190	1,310	2,740	10.1	11.27	163,000	A.
May.....	5,430	2,170	3,280	12.1	13.95	202,000	A.
June.....	4,710	1,820	2,950	10.9	12.16	176,000	B.
July.....	4,070	1,710	2,740	10.1	11.64	168,000	B.
August.....	2,300	1,400	1,730	6.41	7.39	106,000	B.
September.....	4,490	970	1,780	6.59	7.35	106,000	B.
The year.....	23,900	695	2,400	8.89	120.77	1,740,000	

WHATCOM LAKE NEAR BELLINGHAM, WASH.

LOCATION.—In sec. 27, T. 38 N., R. 3 E., at headworks of Bellingham water supply.
DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 12 to September 30, 1914, when station was discontinued.

GAGE.—Vertical staff on pile under pump house. Gage readings may be reduced to elevations above sea-level by adding 310 feet.

EXTREMES OF STAGE.—Maximum stage recorded during year, 5.65 feet December 1-4; minimum stage recorded, 3.4 feet September 5-7.

1913-1914: Maximum stage recorded, 5.75 feet at 10.30 a. m. February 19, 1913; minimum stage recorded, 3.4 feet September 5-7, 1914.

WINTER FLOW.—No ice.

COOPERATION.—Records furnished by city engineer.

Daily gage height, in feet, of Whatcom Lake near Bellingham, Wash., for the year ending Sept. 30, 1914.

[C. H. Lushby, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	3.95	4.75	5.65	4.2	5.1	4.95	4.9	5.0	4.45	4.4	3.85	3.45
3.....	3.9	4.7	5.65	4.15	5.1	4.95	4.9	5.0	4.45	4.4	3.8	3.45
3.....	3.9	4.65	5.65	4.2	5.1	4.95	4.9	5.0	4.45	4.4	3.8	3.45
4.....	3.9	4.65	5.65	.....	5.1	4.95	4.9	5.0	4.45	4.4	3.8	3.45
5.....	3.85	4.7	5.6	.....	.....	4.95	4.9	5.0	4.4	4.35	3.8	3.4
6.....	3.85	4.75	5.55	4.8	4.95	4.9	4.9	5.0	4.4	4.3	3.8	3.4
7.....	3.9	4.7	5.5	5.1	4.9	4.9	4.9	5.0	4.4	4.3	3.75	3.4
8.....	3.95	4.7	5.45	5.4	4.85	4.85	4.9	4.95	4.5	4.3	3.75	3.5
9.....	4.0	4.7	5.35	5.5	4.8	4.8	4.85	4.95	4.4	4.25	3.75	3.5
10.....	4.05	4.7	5.3	5.55	4.75	4.8	4.85	4.95	4.4	4.25	3.7	3.5
11.....	4.6	4.7	5.2	5.55	4.7	4.8	4.9	4.9	4.4	4.25	3.7	3.5
12.....	4.9	4.7	5.05	5.4	4.7	4.75	4.9	4.9	4.4	4.25	3.7	3.5
13.....	5.05	4.7	5.0	5.35	4.65	4.75	4.85	4.9	4.4	4.25	3.7	3.5
14.....	5.3	4.65	4.95	5.35	4.6	4.75	4.8	4.85	4.4	4.2	3.7	3.5
15.....	5.35	4.75	4.9	5.4	4.6	4.75	4.85	4.75	4.35	4.2	3.7	3.45
16.....	5.35	4.8	4.85	5.3	4.55	4.85	4.9	4.75	4.35	4.15	3.65	3.65
17.....	5.35	4.8	4.8	5.25	4.5	4.9	4.9	4.75	4.3	4.15	3.65	3.7
18.....	5.3	4.85	4.75	5.2	4.5	4.9	4.9	4.7	4.3	4.15	3.65	3.7
19.....	5.25	4.9	4.7	5.2	4.45	4.9	4.95	4.7	4.25	4.15	3.65	3.75
20.....	5.2	4.95	4.65	5.15	4.45	4.9	5.0	4.65	4.25	4.15	3.6	3.7
21.....	5.2	5.05	4.6	5.1	4.45	4.9	5.0	4.65	4.25	4.1	3.6	3.7
22.....	5.15	5.1	4.5	5.05	.....	4.85	5.05	4.6	4.4	4.05	3.6	3.7
23.....	5.1	5.2	4.45	5.0	.....	4.85	5.05	4.6	4.4	4.0	3.6	3.7
24.....	5.1	5.3	4.45	4.9	.....	4.85	5.05	4.6	4.4	4.0	3.55	3.7
25.....	5.05	5.4	4.4	.....	.....	4.9	5.05	4.6	4.4	4.0	3.55	3.7
26.....	5.05	5.45	4.35	.....	.....	4.9	5.0	4.6	4.4	3.95	3.55	3.75
27.....	5.0	5.5	4.35	.....	.....	4.9	5.05	4.6	4.45	3.95	3.5	.....
28.....	4.95	5.55	4.3	.....	.....	4.9	5.05	4.55	4.4	3.95	3.55	3.8
29.....	4.9	5.55	4.25	.....	.....	4.95	5.05	4.55	4.35	3.9	3.55	3.8
30.....	4.85	5.6	4.2	.....	.....	5.0	5.05	4.5	4.4	3.9	3.5	3.8
31.....	4.8	.....	4.2	.....	.....	4.95	.....	4.5	.....	3.85	3.5	.....

NOTE.—During August and September gage heights slightly affected by timber dam built across outlet May 25 and 26 for the purpose of controlling the low-water level.

WHATCOM CREEK NEAR BELLINGHAM, WASH.

LOCATION.—In sec. 28, T. 38 N., R. 3 E., at the Northern Pacific Railway siding bridge opposite Larson station on the Bellingham Electric Railway, about one-half mile below outlet of Whatcom Lake and 3 miles east of Bellingham.

DRAINAGE AREA.—66 square miles.

RECORDS AVAILABLE.—November 1, 1910, to September 30, 1914, when station was discontinued.

GAGE.—Vertical staff spiked to pile of bridge.

DISCHARGE MEASUREMENTS.—Made from the railway bridge or by wading.

CHANNEL AND CONTROL.—Solid rock.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.1 feet at 2.30 p. m. January 10 (discharge not computed); minimum stage recorded, 2.1 feet at 8.40 a. m. August 9 (discharge not computed).

1910-1914: Maximum stage recorded, 5.50 feet November 20-21, 1911 (discharge, 739 second-feet); minimum stage recorded, 2.10 feet May 7, 1911 (discharge 2, second-feet); and 2.10 feet at 8.40 a. m., August 9, 1914 (discharge not computed).

STORAGE.—Natural, in Whatcom Lake.

COOPERATION.—Gage-height record furnished by the city engineer of Bellingham.

Data insufficient for estimates of discharge.

Discharge measurements of Whatcom Creek near Bellingham, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 6	James E. Stewart.....	2.92	25.8
May 18	I. L. Collier.....	3.50	83.3

a Discharge relation affected by backwater from log jam on control.

Daily gage height, in feet, of Whatcom Creek near Bellingham, Wash., for the year ending Sept. 30, 1914.

[C. H. Lusby, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	2.95	4.2	4.4	3.95	4.6	4.4	3.8	3.8	3.35	3.2	2.6	2.3
2.....	2.95	3.9	4.4	3.95	4.6	4.4	3.8	3.8	3.35	3.2	2.6	2.25
3.....	2.95	3.95	4.4	3.95	4.6	4.4	3.8	3.8	3.35	3.2	2.6	2.25
4.....	2.9	4.0	4.4	.....	4.6	4.4	3.8	3.8	3.35	3.2	2.3	2.25
5.....	2.9	4.0	4.4	.....	4.5	4.4	3.8	3.8	3.3	3.15	2.4	2.2
6.....	2.85	4.0	4.0	4.3	4.5	4.4	3.8	3.8	3.3	3.15	2.6	2.2
7.....	2.9	3.95	5.0	4.7	4.45	4.35	3.8	3.8	3.3	3.1	2.6	2.2
8.....	2.95	3.95	4.9	4.9	4.4	4.1	3.85	3.75	3.4	3.1	2.6	2.3
9.....	3.0	3.95	4.8	5.0	4.3	3.95	3.8	3.7	3.3	3.1	2.1	2.3
10.....	3.1	3.95	4.8	5.1	4.35	3.9	3.8	3.7	3.3	3.1	2.55	2.35
11.....	3.6	3.9	4.75	5.0	4.3	3.9	3.8	3.7	3.3	3.1	2.55	2.35
12.....	4.0	3.9	4.7	4.8	4.3	3.9	3.8	3.7	3.3	3.1	2.5	2.35
13.....	4.3	3.9	4.6	4.8	4.25	3.9	3.8	3.7	3.3	3.1	2.5	2.35
14.....	4.5	3.9	4.55	4.8	4.2	3.9	3.8	3.7	3.3	3.05	2.35	2.3
15.....	4.45	3.9	4.5	4.8	4.2	3.9	3.8	3.65	3.25	3.05	2.3	2.5
16.....	4.40	3.9	4.45	4.75	4.15	3.9	3.8	3.6	3.25	3.0	2.3	2.55
17.....	4.35	3.9	4.4	4.7	4.1	3.9	3.8	3.6	3.2	3.0	2.25	2.6
18.....	4.3	3.95	4.4	4.65	4.1	3.9	3.8	3.55	3.2	2.95	2.25	2.6
19.....	4.3	3.95	4.4	4.65	4.1	3.9	3.85	3.55	3.15	2.95	2.3	2.6
20.....	4.35	4.0	4.35	4.6	4.1	3.9	3.85	3.5	3.1	2.95	2.3	2.6
21.....	4.3	4.05	4.3	4.55	4.1	3.9	3.8	3.5	3.1	2.9	2.3	2.6
22.....	4.25	4.05	4.25	4.5	3.85	3.85	3.85	3.5	3.2	2.9	2.3	2.6
23.....	4.2	4.05	4.2	4.5	3.85	3.85	3.85	3.5	3.3	2.9	2.3	2.6
24.....	4.15	4.1	4.2	4.4	3.85	3.85	3.85	3.4	3.3	2.85	2.25	2.6
25.....	4.1	4.2	4.15	.....	3.85	3.85	3.85	3.4	3.3	2.75	2.25	2.6
26.....	4.1	4.2	4.1	.....	3.85	3.85	3.85	3.3	3.25	2.7	2.25	2.6
27.....	4.3	4.2	4.1	.....	3.85	3.85	3.9	3.2	3.3	2.7	2.25	.....
28.....	4.25	4.25	4.05	.....	3.8	3.8	3.9	3.4	3.25	2.7	2.4	2.65
29.....	4.2	4.4	4.0	.....	.....	3.85	3.85	3.4	3.2	2.65	2.4	2.65
30.....	4.15	4.4	3.95	.....	.....	3.9	3.85	3.4	3.25	2.6	2.3	2.65
31.....	3.9	.....	3.95	.....	.....	3.85	.....	3.4	.....	2.6	2.3	.....

UPPER COLUMBIA RIVER BASIN.

KOOTENAI RIVER AT LIBBY, MONT.

LOCATION.—In sec. 3, T. 30 N., R. 31 W., at highway bridge opposite Great Northern Railway station at Libby, about one-fourth mile from the town and post office.

DRAINAGE AREA.—11,000 square miles.

RECORDS AVAILABLE.—October 13, 1910, to September 30, 1914.

GAGE.—Chain, in left span of highway bridge; prior to completion of bridge a temporary staff gage fastened to an old stump on the right bank just below the bridge. In February, 1913, gage datum was lowered 2 feet; all readings prior to change reduced to new datum.

DISCHARGE MEASUREMENTS.—Made from the bridge; prior to erection of bridge from the ferry cable.

CHANNEL AND CONTROL.—Channel permanent; broken by two piers. Bed of stream composed of small rocks; current fairly swift and uniformly distributed.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.1 feet at 4.30 p. m. June 5 (discharge, 56,900 second-feet); minimum stage recorded, 1.4 feet at 3 p. m. February 7 (discharge, 1,690 second-feet).

1910-1914: Maximum stage recorded, 14.3 feet June 4, 1913 (discharge, 77,300 second-feet); minimum stage recorded, 1.4 feet February 7, 1914 (discharge, 1,690 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice except for short periods.

DIVERSIONS.—None of importance.

ACCURACY.—Results excellent.

COOPERATION.—Gage-height record furnished by United States Forest Service.

The following discharge measurement was made by W. A. Lamb: December 16, 1913; gage height, 2.71 feet; discharge, 4,060 second-feet.

Daily discharge, in second-feet, of Kootenai River at Libby, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	7,890	6,280	5,370	3,780	3,550	3,550	4,270	15,000	27,000	30,100	13,300	7,560
2.....	7,890	5,970	4,800	3,330	3,780	3,590	4,270	18,200	32,700	31,400	13,300	7,230
3.....	7,560	5,970	4,530	3,780	3,780	3,660	4,270	25,200	41,200	33,400	13,300	7,230
4.....	7,560	5,970	4,530	3,550	3,120	3,740	4,270	30,100	42,700	35,800	12,800	6,910
5.....	7,230	5,670	4,270	3,780	2,180	3,570	5,280	30,100	56,900	38,200	12,400	6,910
6.....	7,230	5,670	4,020	4,530	1,840	3,470	6,280	27,600	53,400	39,000	12,400	6,750
7.....	7,230	5,970	3,780	5,970	1,690	3,420	7,890	22,400	44,300	37,500	11,600	6,590
8.....	6,910	5,970	3,780	7,560	2,170	3,330	7,890	20,800	35,400	35,400	11,600	6,590
9.....	6,910	5,670	3,550	6,910	2,650	3,420	8,230	22,400	31,400	33,400	11,400	6,590
10.....	6,590	5,670	3,550	5,970	2,780	3,470	8,570	25,800	27,600	31,400	11,200	6,590
11.....	6,590	5,670	3,330	5,370	2,890	3,470	8,570	28,800	25,200	29,500	10,800	6,590
12.....	6,910	5,670	3,330	5,080	3,040	3,400	9,280	28,200	24,700	28,200	10,000	6,280
13.....	7,230	5,670	4,020	4,530	3,510	3,430	10,000	27,600	26,400	27,000	9,640	6,280
14.....	8,230	5,670	3,780	4,530	3,570	3,860	11,600	28,200	31,400	27,600	9,280	6,280
15.....	8,920	5,370	4,020	4,800	3,700	5,080	13,300	31,400	36,800	30,100	9,370	6,280
16.....	8,570	5,080	4,020	4,530	3,510	5,370	14,100	36,800	42,000	29,500	9,460	6,280
17.....	8,230	5,080	3,780	4,020	3,470	5,370	14,100	43,500	45,900	27,600	9,550	6,280
18.....	7,890	5,670	3,550	4,270	3,270	5,670	13,700	43,500	50,800	24,100	9,650	6,590
19.....	7,560	6,280	3,330	4,270	3,230	5,670	12,800	42,700	54,300	20,800	10,000	6,910
20.....	7,230	5,970	3,330	4,020	3,320	5,670	15,400	39,000	55,100	20,300	9,650	8,230
21.....	7,230	5,670	3,780	3,780	3,110	5,080	17,300	36,800	50,000	20,300	9,280	9,280
22.....	6,910	5,370	3,330	3,550	3,120	5,080	16,800	34,000	42,700	20,800	8,920	8,920
23.....	6,910	4,800	3,120	3,120	3,140	4,800	16,400	34,700	34,700	18,200	8,920	8,570
24.....	6,910	4,530	2,940	3,120	3,280	4,800	16,400	35,400	29,500	16,400	8,570	8,230
25.....	6,910	5,080	2,760	3,550	3,430	5,080	16,400	37,500	26,400	15,400	8,570	7,890
26.....	6,910	5,370	2,940	3,330	3,470	4,800	16,400	38,200	27,600	15,000	8,230	7,890
27.....	6,910	5,370	3,330	2,940	3,550	4,270	15,900	36,100	29,500	14,600	7,890	8,230
28.....	6,590	5,370	3,550	3,330	3,470	4,020	15,400	32,000	28,200	14,100	7,890	8,570
29.....	6,590	5,370	3,780	3,550	.....	4,270	14,600	28,800	28,200	14,100	7,560	8,920
30.....	6,590	5,080	3,780	3,550	.....	4,270	14,100	25,800	28,800	13,700	7,560	9,280
31.....	6,280	.....	3,780	3,550	.....	4,530	.....	25,200	.....	13,300	7,560	.....

NOTE.—Discharge determined from a well-defined rating curve except Feb. 7-28 and Mar. 9-14, for which periods it was determined from a fairly well-defined rating curve applied to readings of an auxiliary gage one-fourth mile below regular gage. Discharge interpolated, owing to lack of gage readings, Oct. 19, Feb. 8, 22; Apr. 5, 24; July 4, 12; Aug. 4, 9, 13, 15-17; and Sept. 6.

Monthly discharge of Kootenai River at Libby, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	8,920	6,280	7,260	446,000	A.
November.....	6,280	4,530	5,560	331,000	A.
December.....	5,370	2,760	3,730	229,000	B.
January.....	7,560	2,940	4,260	262,000	B.
February.....	3,780	1,690	3,130	174,000	B.
March.....	5,670	3,330	4,300	264,000	B.
April.....	17,300	4,270	11,500	684,000	A.
May.....	43,500	15,000	30,700	1,890,000	A.
June.....	56,900	24,700	37,000	2,200,000	A.
July.....	39,000	13,300	25,400	1,560,000	A.
August.....	13,300	7,560	10,100	621,000	A.
September.....	9,280	6,280	7,360	438,000	A.
The year.....	56,900	1,690	12,600	9,100,000	

CALLAHAN CREEK AT TROY, MONT.

LOCATION.—At the highway bridge in sec. 13, T. 31 N., R. 34 W., one-fourth mile southeast of Troy.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 11, 1911, to December 16, 1913, and fragmentary gage record to September 30, 1914.

GAGE.—Vertical staff attached to the right abutment of bridge; washed out May 24, 1913; replaced October 12, 1913, at datum 1.60 feet lower.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Small rocks and gravel; may shift.

EXTREMES OF STAGE.—Maximum stage recorded during year, 3.05 feet at 7 p. m. May 17 (discharge not computed); minimum stage recorded, 0.35 foot at 3 p. m. September 26 (discharge not computed).

1911-1913: Maximum stage recorded, 3.7 feet May 9 and 15, 1912 (discharge, 1,300 second-feet); minimum discharge estimated at 12 second-feet October 29-31, 1911.

WINTER FLOW.—Discharge relation affected by ice; no records available.

DIVERSIONS.—None of importance.

ACCURACY.—Records fair.

COOPERATION.—Gage-height record furnished by United States Forest Service. Estimates January 1 to September 30, 1914, withheld for additional data.

The following discharge measurement was made by W. A. Lamb: December 16, 1913; gage height, 0.88 foot; discharge, 54 second-feet.

Daily gage height, in feet, of Callahan Creek at Troy, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.		0.9	1.2		1.7		1.5					
2.		1.0						2.8	2.4		0.42	
3.			1.0		1.7				2.6			
4.			1.0					2.8				
5.					1.9							
6.			.9	1.9	2.1							
7.			.9	1.8								
8.				1.7	2.2				1.3	9.5		
9.			.9	1.6		0.9	2.0					
10.				1.5		1.0	1.9	2.7				
11.		1.2	.9	1.5		1.0						
12.	1.05	1.2	1.0	1.4			2.2			1.15		
13.	1.2	1.0					2.5	2.8	1.7			
14.	1.3					1.2						
15.				1.0		1.5						
16.	1.1		.9			1.3		2.95	2.0			
17.		1.0		1.0		1.4		3.05	1.6			
18.	1.0											
19.						1.6						
20.	1.0			1.0				2.6				
21.	1.0		1.9						1.4	.5		
22.	.9	1.2		1.0								
23.	.9	1.2	2.0	1.1		1.4		2.6	1.2			
24.	.9						2.0					
25.	.9			1.2						.45		
26.	.9	1.1	2.1					2.5	1.6			0.35
27.			2.2	1.4								
28.						1.2						
29.	.9	1.2		1.6								
30.	.9						2.6	2.3				
31.						1.5						

Daily discharge, in second-feet, of Callahan Creek at Troy, Mont., Oct. 1 to Dec. 12, 1913.

Oct. 12.	85	Oct. 26.	57	Nov. 26.	95
13.	120	29.	57	29.	120
14.	150	30.	57	Dec. 1.	120
16.	95	Nov. 1.	57	3.	75
18.	75	2.	75	4.	75
20.	75	11.	120	6.	57
21.	75	12.	120	7.	57
22.	57	13.	75	9.	57
23.	57	17.	75	11.	57
24.	57	22.	120	12.	75
25.	57	23.	120		

NOTE.—Discharge Oct. 12 to Dec. 12 determined from a poorly defined rating curve. Discharge relation affected by ice Dec. 21 to Feb. 8. Water below bottom of gage Aug. 3 to Sept. 25. No measurements made in 1914; discharge not computed.

YAAK RIVER NEAR TROY, MONT.

LOCATION.—Near north line of T. 32 N., R. 34 W., at highway bridge near mouth of the stream, about 10 miles northwest of Troy.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 2 to September 30, 1914, at present site; October 15, 1910, to May 6, 1912, staff gage on right bank one-half mile above Yaak Falls, near south line of sec. 33, T. 34 N., R. 33 W.; May 8, 1912, to June 17, 1912, staff gage at Fritz Lang's ranch near Sylvanite, 4 miles upstream; June 18, 1912, to March 2, 1914, staff gage 300 feet farther downstream and at a different datum.

GAGE.—Vertical staff on downstream side of left abutment at highway bridge.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Gravel and bowlders; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.9 feet at 10 a. m., April 16 (discharge not computed); minimum stage recorded, 1.2 feet at 11 a. m. September 14 (discharge not computed).

1910-1914: Maximum stage recorded, 3.69 feet May 15, 1912 (discharge, 4,240 second-feet); minimum stage recorded, 2.88 feet March 22, 1913 (discharge, 193 second-feet).

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—None.

Estimates withheld for additional data.

The following discharge measurement was made by E. W. Kramer:

March 2, 1914: Gage height, 1.47 feet; discharge, 276 second-feet.

Daily gage height, in feet, of Yaak River near Troy, Mont., for the year ending Sept. 30, 1914.

Mar. 5.....	1.3	Apr. 14.....	3.5	Aug. 2.....	1.5
7.....	1.35	15.....	3.7	5.....	1.5
8.....	1.4	16.....	3.9	7.....	1.45
12.....	1.5	18.....	3.7	8.....	1.45
13.....	1.6	29.....	3.25	Sept. 14.....	1.2
15.....	2.0	30.....	3.4	16.....	1.35
16.....	2.1	June 14.....	2.9	25.....	1.45
17.....	2.2	22.....	2.4	29.....	1.4
18.....	2.2	28.....	2.5		
21.....	2.1	Aug. 1.....	1.5		

MOYIE RIVER AT SNYDER, IDAHO.

LOCATION.—In sec. 23, T. 64 N., R. 2 E. Boise meridian, at Snyder ranger station, a quarter of a mile west of Snyder station on Spokane & International Railway, 3½ miles below Round Prairie Creek, 12 miles above mouth, in Boundary County.

DRAINAGE AREA.—717^a square miles (measured on Cranbrook sheet, British Columbia map, and map of Priest Lake quadrangle).

RECORDS AVAILABLE.—February 21, 1912, to September 30, 1914, at present site; March 10, 1911, to February 20, 1912, at railway bridge 1 mile downstream.

GAGE.—Since February 21, 1912, vertical and inclined staff on left bank 150 feet west of Snyder ranger station; from March 10, 1911, to February 20, 1912, vertical staff attached to left abutment of railway bridge 1 mile below present gage.

DISCHARGE MEASUREMENTS.—Made by wading at gage or from highway bridge one-fourth mile downstream.

CHANNEL AND CONTROL.—Stream bed composed of small bowlders and gravel; gradient relatively steep; straight both above and below gage; both banks high and will not overflow; control approximately 500 feet below gage and formed by gravel and bowlder riffle; shifting at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.4 feet at 7 a. m. and 5 p. m. May 16 (discharge, 6,120 second-feet); minimum stage recorded, 3.00 feet September 4-6 (discharge, 100 second-feet).

1911-1914: Maximum stage recorded, 9.3 feet May 31 and June 1-2, 1913 (discharge, 8,020 second-feet); minimum stage recorded, 2.90 feet March 9-10, 12-13, 1912 (discharge, 91 second-feet).

WINTER FLOW.—Discharge relation seriously affected by ice.

ACCURACY.—Observer's record apparently reliable, but gaps are frequent owing to his absence from the ranger station. Curve fairly well defined between 200 and 3,000 second-feet. Discharge relation affected by ice for short periods each winter; estimates approximate. For periods in which ice is not present and record is continuous results are apparently good.

^a Revised measurement.

Discharge measurements of Moyie River at Snyder, Idaho, during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
Jan. 15	L. W. Jordan.....	<i>Feet.</i> 3.90	<i>Sec.-ft.</i> 472	Feb. 28	E. W. Kramer.....	<i>Feet.</i> 3.40	<i>Sec.-ft.</i> 223
16	do.....	3.85	446	June 11	do.....	5.70	2,400

Daily discharge, in second-feet, of Moyie River at Snyder, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	187		170	274	224	665	2,830	3,240	1,440	288	122
2.....	187		170	257	265	665	3,240	3,820	1,340	265	115
3.....	187		170	240	265	665	4,600	4,760	1,340	244	112
4.....	187		170	187	265	740	4,440	4,440	1,250	244	100
5.....	187		320	140	224	900	3,820	4,280	1,160	244	100
6.....	180		780	140	224	1,040	3,520	3,820	1,163	244	100
7.....	177		1,030	170	224	1,150	3,820	3,520	1,070	244	105
8.....	167	154	942	224	224	1,320	3,820	2,960	1,030	244	105
9.....	167	154	702	232	224	1,470	4,440	2,570	985	232	105
10.....	174	154	595	249	224	1,610	4,600	2,200	900	206	105
11.....	180	154	530	265	224	1,750	4,600	2,080	820	194	108
12.....	180	180	530	265	224	1,860	4,400	2,080	740	187	112
13.....	180	224	530	257	348	2,200	4,600	2,320	740	180	112
14.....	265	224	500	244	472	2,440	4,930	2,320	740	174	112
15.....	274	217	469	224	595	2,570	5,780	2,320	740	170	112
16.....	288	206	440	224	630	3,100	6,120	2,320	702	170	120
17.....	288	187	412	206	665	2,440	5,950	2,700	702	170	131
18.....	288	187	386	194	595	2,770	5,950	2,440	665	206	151
19.....	265	180	386	187	820	3,100	5,950	2,320	595	184	194
20.....	265	154	359	194	820	3,820	5,440	2,200	595	180	270
21.....	257	154	359	206	740	3,380	4,760	1,970	530	180	265
22.....	257	170	359	224	740	2,960	4,760	1,860	469	174	232
23.....		170	310	224	740	3,100	4,760	1,860	469	164	217
24.....		170	310	224	740	3,100	4,760	1,860	440	164	187
25.....		170	310	224	740	2,960	4,760	1,860	386	154	174
26.....		180	334	224	665	2,960	4,440	1,860	359	148	154
27.....		187	320	224	595	2,700	3,820	1,860	359	140	154
28.....		187	320	224	595	2,440	3,670	1,750	349	125	154
29.....		170	310		595	2,440	3,380	1,640	334	125	154
30.....		170	298		595	2,570	3,100	1,540	310	125	154
31.....		170	286		595		3,100		310	125	

NOTE.—Discharge determined from a rating curve fairly well defined between 200 and 3,000 second-feet. Discharge interpolated owing to lack of gage readings Jan. 14, 30-31, Mar. 13-14, Apr. 6-10, 18. Discharge estimated, because of ice, from observer's notes and climatic records, Feb. 4-7.

Monthly discharge of Moyie River at Snyder, Idaho, for the year ending Sept. 30, 1914.

[Drainage area, 717 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October 1-22.....			218	0.304	0.25	9,510	B.
December 8-31.....			178	.248	.22	8,470	B.
January.....	1,030	170	423	.590	.68	26,000	B.
February.....	274		220	.307	.32	12,200	B.
March.....	820	224	487	.679	.78	29,900	B.
April.....	3,820	665	2,160	3.01	3.36	129,000	B.
May.....	6,120	2,830	4,460	6.22	7.17	274,000	B.
June.....	4,760	1,540	2,560	3.57	3.98	152,000	B.
July.....	1,440	310	743	1.04	1.20	45,700	B.
August.....	288	125	190	.265	.31	11,700	B.
September.....	270	100	145	.202	.23	8,630	B.

CLARK FORK AT ST. REGIS, MONT.

LOCATION.—In sec. 19, T. 18 N., R. 27 W., at McLeod's ferry at St. Regis, about half a mile below mouth of St. Regis River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 26, 1910, to September 30, 1914.

GAGE.—Vertical staff in three sections on left bank.

DISCHARGE MEASUREMENTS.—Made from ferry cable.

CHANNEL AND CONTROL.—Practically permanent; current swift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 14.0 feet at 9.15 a. m. May 15 (discharge, 34,000 second-feet); minimum stage recorded, 3.8 feet at 9.30 a. m. September 7 and 8 (discharge, 2,480 second-feet).

1910-1914: Maximum stage recorded, 19.1 feet May 30 and 31, 1913 (discharge, 62,800 second-feet); minimum stage recorded, 2.9 feet, January 4, 1912 (discharge, 1,710 second-feet).

WINTER FLOW.—Discharge relation not affected by ice except in short periods during extremely cold weather.

DIVERSIONS.—Water diverted from several of the tributaries to irrigate lands in the vicinity of Missoula and in the Bitterroot Valley.

ACCURACY.—Results excellent.

The following discharge measurement was made by W. A. Lamb:

September 20, 1913: Gage height, 4.65 feet; discharge, 3,400 second-feet.

Daily discharge, in second-feet, of Clark Fork at St. Regis, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	2,980	3,890	3,230	2,620	2,620	3,100	4,420	14,800	22,600	8,700	3,720	2,620
2.....	2,880	3,720	3,100	2,700	2,750	3,100	4,610	13,500	24,600	8,700	3,550	2,780
3.....	2,780	3,890	3,100	2,780	2,550	3,230	4,820	16,600	26,700	9,200	3,720	2,620
4.....	2,880	4,060	2,980	2,780	2,550	3,230	4,820	21,400	28,000	9,200	3,550	2,550
5.....	2,980	4,060	2,980	2,780	2,620	3,230	5,030	20,300	27,200	8,700	3,380	2,550
6.....	3,100	4,060	2,880	2,980	2,620	3,100	6,120	18,000	26,300	8,700	3,380	2,620
7.....	3,550	4,230	2,780	3,230	2,620	3,100	7,720	19,200	24,600	8,450	3,380	2,480
8.....	3,720	4,230	2,780	3,100	2,620	3,230	8,200	19,200	21,800	8,200	3,380	2,480
9.....	3,890	4,060	2,700	3,230	2,620	3,230	8,200	19,500	25,000	7,720	3,380	2,620
10.....	4,060	3,890	2,700	3,100	2,620	3,380	8,450	29,800	21,000	7,480	3,380	2,550
11.....	4,060	4,060	2,780	2,880	2,620	3,550	8,450	17,300	19,400	7,000	3,100	2,550
12.....	4,060	4,060	2,780	2,880	2,780	3,720	8,200	29,300	17,700	7,000	2,980	2,550
13.....	4,060	4,060	2,780	2,700	2,780	3,720	8,450	25,000	19,600	7,000	2,980	2,700
14.....	4,060	4,060	2,880	2,780	2,780	3,890	9,200	29,300	21,400	6,780	2,780	2,700
15.....	4,230	3,890	2,880	2,780	2,780	4,060	9,700	34,000	25,000	6,340	2,780	2,780
16.....	4,060	3,720	2,980	2,880	2,780	4,610	9,970	29,300	17,300	5,900	2,880	2,880
17.....	3,890	3,720	2,880	2,880	2,980	5,680	9,970	27,600	17,300	5,900	2,780	2,880
18.....	3,890	3,720	2,780	2,780	2,880	6,780	9,700	30,200	18,500	5,680	2,880	2,980
19.....	3,720	3,890	2,700	2,700	2,880	7,480	9,970	29,800	19,800	5,460	2,780	3,230
20.....	3,720	3,890	2,620	2,780	2,780	7,000	11,100	28,900	21,000	4,920	2,780	3,230
21.....	3,720	3,720	2,620	2,780	2,700	6,780	12,300	28,000	10,800	4,610	2,700	3,230
22.....	3,720	3,890	2,620	2,880	2,780	6,560	13,200	27,600	11,100	4,820	2,700	3,380
23.....	3,230	3,550	2,620	2,780	2,700	5,240	13,800	28,900	17,300	4,820	2,780	3,380
24.....	3,550	3,380	2,700	2,780	2,700	4,820	13,500	31,200	13,200	4,610	2,700	3,380
25.....	3,890	3,550	2,700	2,780	2,700	5,240	14,200	33,100	13,500	4,420	2,700	3,230
26.....	4,060	3,550	2,780	2,780	2,780	5,030	14,200	31,200	13,500	4,230	2,780	3,230
27.....	4,060	3,550	2,780	2,780	2,780	4,820	14,400	26,700	13,200	4,420	2,620	3,380
28.....	4,060	3,380	2,780	2,880	2,880	4,230	14,700	25,900	12,900	4,230	2,620	2,980
29.....	4,060	3,380	2,700	2,700	.....	4,060	15,000	24,600	10,800	4,060	2,700	2,980
30.....	3,890	3,230	2,700	2,620	.....	4,230	15,200	23,400	10,200	4,060	2,620	3,230
31.....	3,890	.....	2,620	2,620	.....	4,230	.....	22,600	.....	3,720	2,620	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge relation probably affected by ice and discharge estimated Feb. 3-6 and 8-15. Discharge interpolated, owing to lack of gage readings, Apr. 27-29, June 2, 11, 13, 18, and 19.

Monthly discharge of Clark Fork at St. Regis, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	4,230	2,780	3,700	228,000	A.
November.....	4,230	3,230	3,810	227,000	A.
December.....	3,230	2,620	2,800	172,000	A.
January.....	3,230	2,620	2,830	174,000	A.
February.....	2,980	.....	2,720	151,000	B.
March.....	7,480	3,100	4,440	273,000	A.
April.....	15,200	4,420	9,920	590,000	A.
May.....	34,000	13,500	25,000	1,540,000	A.
June.....	28,000	10,200	19,000	1,130,000	A.
July.....	9,200	3,720	6,280	386,000	A.
August.....	3,720	2,620	3,000	184,000	A.
September.....	3,380	2,480	2,890	172,000	A.
The year.....	34,000	.....	7,220	5,230,000	

CLARK FORK NEAR PLAINS, MONT.

LOCATION.—In lot 7, sec. 1, T. 19 N., R. 26 W., at Cooper's ferry, about 3 miles above Plains, and about 7 miles below mouth of Flathead River.

DRAINAGE AREA.—19,900 square miles.

RECORDS AVAILABLE.—October 28, 1910, to September 30, 1914.

GAGE.—Barrett and Lawrence water-stage recorder installed November 28, 1911, 50 feet below an overhanging chain gage on right bank about 150 feet below ferry cable. Prior to November 28, 1911, the chain gage was read.

DISCHARGE MEASUREMENTS.—Made from the bridge at Plains.

CHANNEL AND CONTROL.—Practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from automatic gage record, 13.2 feet at 4 a. m., May 25 (discharge, 67,000 second-feet); minimum stage from automatic gage record, 3.6 feet at 8 a. m., February 7 (discharge, 5,970 second-feet). 1910-1914: Maximum stage recorded, 17.9 feet June 5, 1913 (discharge, 115,000 second-feet); minimum stage recorded, 3.6 feet March 9-10, 1912 (discharge, 5,290 second-feet). (See also descriptions of gages.)

WINTER FLOW.—Stream freezes over at gage for short periods during winter, but is open at control section below gage. Discharge relation little if any affected by ice.

DIVERSIONS.—A number of small ditches take water for irrigation from tributaries of Flathead River and headwaters of Clark Fork.

ACCURACY.—Results good.

Discharge measurements of Clark Fork near Plains, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Dec. 9.....	4.51	8,160	Sept. 18.....	4.58	8,720
May 8.....	9.55	38,000			

Daily discharge, in second-feet, of Clark Fork near Plains, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	9,030	8,720	9,030	7,600	7,090	8,420	8,420	27,100	57,700	35,100	14,100	8,420
2.	8,880	8,720	9,030	7,600	6,850	9,030	8,420	28,500	57,700	34,400	14,100	8,720
3.	8,720	8,720	9,030	7,340	7,090	8,420	8,420	30,600	59,500	33,600	13,600	8,420
4.	8,720		9,030	7,340	6,850	8,420	8,420	34,400	62,300	32,100	13,200	8,420
5.	8,720		9,030	7,340	6,180	7,860	9,030	36,700	62,300	32,100	12,300	8,420
6.	8,720		8,720	7,340	5,970	7,860	9,680	36,700	61,300	30,600	12,300	8,420
7.	8,720		8,420	7,340	5,970	7,600	11,100	36,700	60,400	30,600	11,900	8,420
8.	8,720		8,130	7,340	6,620	7,860	11,900	36,700	57,700	29,200	11,500	8,420
9.	8,720		8,130	7,340	7,340	7,600	11,900	36,700	53,200	29,200	11,100	8,420
10.	8,720		8,130	7,340	7,600	8,130	12,300	38,200	51,400	27,800	11,100	8,420
11.	8,720		8,130	7,340	7,600	7,860	12,300	39,800	48,800	27,100	11,100	8,420
12.	8,720		7,860	7,340	7,860	8,130	12,700	43,000	46,300	26,400	10,400	8,420
13.	8,720		8,130	7,340	8,130	7,860	13,200	45,500	45,500	25,100	10,400	8,420
14.	8,720		8,130	7,340	8,130	8,130	13,600	45,500	48,000	25,100	10,400	8,420
15.	8,720		8,130	7,600	8,130	7,860	14,600	45,500	48,800	23,800	10,400	8,420
16.	8,720		8,130	7,600	7,600	8,420	16,000	47,200	49,700	22,500	10,000	8,420
17.	8,720		8,130	7,600	7,600	9,350	17,100	49,700	49,700	23,100	10,000	8,420
18.	8,720		8,130	7,600	7,600	9,350	17,100	53,200	48,800	22,500	9,680	8,420
19.	8,720		8,130	7,600	7,340	10,700	17,700	60,400	48,000	20,600	9,680	8,420
20.	8,720		7,860	7,600	7,600	10,700	18,200	60,400	47,200	20,600	9,680	8,420
21.	8,720		7,600	7,340	7,340	10,000	20,000	60,400	46,300	18,800	9,680	8,420
22.	8,720		7,600	7,600	7,340	9,350	22,500	61,300	44,700	18,800	9,680	8,420
23.	8,720	9,350	7,600	7,600	7,340	9,030	24,400	63,200	43,800	18,200	9,680	8,720
24.	8,720	9,350	7,600	7,600	7,340	9,030	24,400	66,000	42,200	18,200	9,350	8,720
25.	8,720	9,350	7,600	7,600	7,600	8,720	26,400	67,000	40,600	17,700	9,350	8,720
26.	8,720	9,350	7,090	7,600	7,600	9,030	26,400	65,100	39,800	17,100	9,350	8,720
27.	8,720	9,350	6,850	7,600	7,600	8,720	27,800	63,200	39,800	16,600	9,030	8,720
28.	8,720	9,350	6,850	7,340	8,720	8,420	27,100	61,300	39,000	16,000	9,030	8,420
29.	8,720	9,350	7,600	7,090		8,130	27,800	59,500	37,400	15,500	9,030	8,420
30.	8,720	9,350	7,860	6,850		8,130	27,100	58,600	36,700	15,000	8,720	8,420
31.	8,720		7,600	6,620		8,130		57,700		14,600	8,720	

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge estimated owing to lack of gage readings, at 9,000 second-feet, Nov. 4-22. Discharge estimated owing to lack of gage readings by hydrographic comparison with discharge of Clark Fork at Thompson Falls, Mont., May 8-18. Discharge relation possibly affected by ice during December, January, and February. Discharge interpolated, owing to lack of gage readings, Oct. 2 and Sept. 4-17.

Monthly discharge of Clark Fork near Plains, Mont., for the year ending Sept. 30, 1914.

[Drainage area, 19,900 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.	9,030	8,720	8,740	537,000	A.
November.	9,350	8,720	9,070	540,000	C.
December.	9,030	6,850	8,040	494,000	B.
January.	7,600	6,620	7,410	456,000	B.
February.	8,720	5,970	7,360	409,000	B.
March.	10,700	7,600	8,590	528,000	A.
April.	27,800	8,420	15,900	1,010,000	A.
May.	67,000	27,100	48,900	3,010,000	A.
June.	62,300	36,700	49,200	2,930,000	A.
July.	35,100	14,600	23,800	1,460,000	A.
August.	14,100	8,720	10,600	652,000	A.
September.	8,720	8,420	8,480	505,000	B.
The year.	67,000	5,970	17,300	12,500,000	

PEND OREILLE LAKE AT SANDPOINT, IDAHO.

LOCATION.—In sec. 23, T. 57 N., R. 2 W. Boise meridian, at Sandpoint municipal wharf on west side of lake, in Bonner County.

DRAINAGE AREA.—23,100 square miles (measured on General Land Office maps).

RECORDS AVAILABLE.—March 18 to September 30, 1914.

GAGE.—Vertical staff nailed to pile at northwest corner of ticket office on municipal dock; read to nearest tenth of a foot for each day for which record is published, by employees of the United States Forest Service.

EXTREMES OF STAGE.—Maximum stage recorded March 18 to September 30, 1914, 17.5 feet, May 28-29 and June 6-7; minimum stage recorded, 5.5 feet September 15-16 and 28-30.

DIVERSIONS.—Considerable diversion from tributaries of Clark Fork for irrigation.

REGULATION.—None.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Daily gage height, in feet, of Pend Oreille Lake at Sandpoint, Idaho., from Mar. 18 to Sept. 30, 1914.

[R. G. Furgeson, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....		6.6		17.3	13.8	8.6	5.9
2.....			11.3	17.3	13.7		5.9
3.....			11.4	17.3	13.5	8.2	5.8
4.....			11.7	17.4		7.9	
5.....		6.6	11.9		13.0		5.8
6.....			12.0	17.5	12.8	7.8	
7.....			12.3	17.5	12.6	7.8	
8.....		6.9	12.4		12.4	7.7	5.7
9.....		7.0	12.7		12.2	7.5	5.6
10.....		7.2	12.8	17.2	12.0		
11.....		7.4	13.1	17.0	11.9		
12.....		7.7	13.3	16.9	11.8		
13.....		7.8	13.7	16.7	11.6		
14.....			13.8	11.3	11.4	7.1	
15.....		8.3	14.0	16.2	11.2		5.5
16.....			8.5	14.4	16.1	11.0	
17.....				14.7	15.9	10.8	5.5
18.....	6.0	9.0	15.0	15.8	10.7		
19.....	6.2	9.1	15.3	15.8		6.7	
20.....	6.3	9.2	15.7	15.6	10.3		
21.....	6.4	9.5	15.9	15.5	10.1		5.6
22.....	6.5	9.6	16.2	15.3	10.1		5.6
23.....	6.6	9.9	16.4	15.0	9.8		5.6
24.....	6.6		16.7	14.9	9.6		
25.....	6.7	10.3	16.9	14.8	9.4	6.4	
26.....	6.9	10.6	17.2	14.7	9.3	6.3	
27.....	6.8	10.8		14.5	9.1	6.2	
28.....	6.7	10.9	17.5	14.3	9.0	6.1	5.5
29.....	6.7		11.5	14.1	8.9	6.1	5.5
30.....	6.7			14.0	8.8	6.0	5.5
31.....	6.7		17.4		8.7	6.0	

CLARK FORK AT METALINE FALLS, WASH.

LOCATION.—In the E. $\frac{1}{2}$ sec. 21, T. 39 N., R. 43 E., just below Sullivan Creek, just above Metaline Falls, and one-fourth mile north of Metaline Falls post office.

DRAINAGE AREA.—25,600 square miles (measured on General Land Office maps).

RECORDS AVAILABLE.—November 4, 1908, to September 4, 1910 (gage heights only); October 1, 1912, to September 30, 1914.

GAGE.—Vertical and inclined staff installed February 12, 1914, in five sections on right bank just above the falls, below Sullivan Creek; prior to this date several gages at slightly different sites and datums were used. Gage heights after October 1, 1912, reduced to datum of the gage installed February 12, 1914. Gage used 1908 to 1910 was a vertical staff on right bank, three-fourths mile above present gage and at a datum approximately 8.35 feet higher than that of gage installed February 12, 1914.

DISCHARGE MEASUREMENTS.—Made from a boat, or through an ice cover. Measuring section is above Sullivan Creek, the discharge of which must be added to the measured discharge of the river.

CHANNEL AND CONTROL.—Banks high and will not overflow; control is formed by crest of Metaline Falls; right bank at control is solid rock; left bank is broken rock in which slides may occur and affect the discharge relation.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the year, 28.7 feet June 1 and 2 (discharge, 70,100 second-feet); minimum discharge, 7,800 second-feet February 7 (estimated by comparison with records at station near Waneta, British, Columbia).

1912–1914: Maximum stage recorded, 41.2 feet June 16, 1913 (discharge, 111,000 second-feet; minimum stage recorded, 4.1 feet February 7, 1913 (discharge, 7,720 second-feet).

WINTER FLOW.—Discharge relation not affected by ice because of the proximity of the falls.

ACCURACY.—Results excellent.

COOPERATION.—Gage-height records prior to June 12, 1914, furnished by Ham, Yearsley & Ryrie.

Discharge measurements of Clark Fork at Metaline Falls, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
Feb. 11	James E. Stewart.....	Feet. 5.80	Sec.-ft. 10,200
June 11	Parker and Brown.....	28.17	68,100

Daily discharge, in second-feet, of Clark Fork at Metaline Falls, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	13,000	11,900	14,600	10,200	11,900	11,900	18,600	40,400	70,100	54,000	26,500	12,800
2.	12,800	12,200	14,300	10,600	10,900	12,200	18,800	41,300	70,100	53,100	25,300	12,800
3.	12,600	12,200	14,300	10,900	10,500	12,600	19,300	42,100	69,800	52,200	24,800	12,400
4.	12,600	12,200	14,300	11,100	9,900	12,800	20,000	42,900	69,500	50,800	24,100	12,400
5.	12,400	12,400	14,100	11,100	9,250	13,000	20,600	43,700	69,200	50,200	23,400	11,700
6.	12,400	12,400	14,100	11,300	8,600	13,000	21,300	45,900	68,900	49,300	23,000	11,500
7.	12,200	12,600	13,900	11,500	7,800	13,200	21,800	45,600	68,900	48,500	22,000	11,500
8.	12,200	12,800	13,700	11,900	8,700	13,500	22,300	46,500	69,200	47,000	21,300	11,500
9.	11,900	13,000	13,500	11,900	9,600	13,500	22,700	47,300	68,900	46,200	20,600	11,100
10.	11,900	13,200	13,200	12,200	10,400	13,700	23,400	49,600	69,200	45,300	20,000	10,800
11.	11,900	13,200	12,800	12,600	10,400	13,700	23,900	50,200	68,600	44,500	20,000	10,800
12.	11,900	13,000	12,800	12,800	10,400	13,700	24,300	51,400	67,700	43,400	19,500	10,400
13.	11,900	12,800	12,400	12,600	10,400	13,700	25,100	52,200	67,100	42,600	19,000	10,400
14.	11,900	12,800	12,200	12,600	10,600	13,700	25,800	53,100	66,200	41,800	18,400	10,400
15.	12,200	12,800	12,200	12,600	10,900	13,700	26,500	54,300	65,600	40,700	18,100	10,600
16.	12,400	12,800	11,900	12,400	11,100	13,900	27,200	55,400	64,700	39,600	17,200	10,400
17.	12,400	13,000	11,700	12,400	10,900	14,300	27,900	56,600	64,100	38,600	17,000	10,800
18.	12,400	13,500	11,700	12,800	10,800	14,800	28,900	57,800	63,500	37,800	16,800	10,800
19.	12,200	13,700	11,500	12,600	10,600	15,200	30,100	58,700	62,600	36,900	16,300	11,100
20.	12,200	13,700	11,300	12,400	10,600	15,900	31,100	59,900	62,000	36,100	16,300	11,100
21.	12,200	13,900	11,100	12,200	10,600	16,500	31,800	61,100	61,400	34,800	15,900	11,100
22.	11,900	13,900	10,900	12,400	10,800	17,000	32,600	62,000	60,500	33,800	15,400	10,900
23.	11,900	14,100	10,800	12,200	10,900	17,400	33,600	63,200	59,900	32,800	15,000	10,800
24.	11,900	14,100	10,600	12,400	11,100	17,400	34,300	64,400	59,000	32,300	15,000	10,800
25.	11,700	14,100	10,400	12,400	11,100	17,400	35,100	65,600	58,400	31,600	14,600	10,900
26.	11,700	14,300	10,200	12,600	11,300	17,700	36,100	66,500	58,100	30,600	14,300	10,800
27.	11,700	14,300	10,000	12,400	11,500	17,700	37,200	67,700	57,200	29,600	14,100	10,800
28.	11,700	14,600	9,850	11,900	11,700	17,700	38,300	68,900	55,400	28,900	13,900	10,600
29.	11,700	14,600	9,670	12,200	.....	17,900	39,100	69,200	54,800	28,200	13,700	10,800
30.	11,900	14,600	9,670	12,400	.....	18,100	39,900	69,500	54,300	27,500	13,200	10,800
31.	11,900	.....	10,000	12,400	.....	18,400	.....	69,800	.....	27,000	12,800	.....

NOTE.—Discharge determined from a well-defined rating curve. As one section of the gage was raised by the ice, the discharge was estimated, Feb. 3-9, from a comparison with record of station near Waneta, British Columbia.

Monthly discharge of Clark Fork at Metaline Falls, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.	13,000	11,700	12,100	744,000	A.
November.	14,600	11,900	13,300	791,000	A.
December.	14,600	9,670	12,100	744,000	A.
January.	12,800	10,200	12,100	744,000	A.
February.	11,900	a 7,800	10,500	583,000	A.
March.	18,400	11,900	15,000	922,000	A.
April.	39,900	18,600	27,900	1,660,000	A.
May.	69,800	40,400	55,600	3,420,000	A.
June.	70,100	54,300	64,200	3,820,000	A.
July.	54,000	27,000	39,900	2,450,000	A.
August.	26,500	12,800	18,300	1,130,000	A.
September.	12,800	10,400	11,100	660,000	A.
The year.	70,100	7,800	24,400	17,700,000	

a Estimated.

RACETRACK CREEK NEAR ANACONDA, MONT.

LOCATION.—In sec. 13, T. 6 N., R. 11 W., opposite Racetrack Creek Ranger station of United States Forest Service.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 11, 1911, to November 9, 1912; April 25 to September 30, 1914.

GAGE.—Vertical staff on right bank in 1914; July 11, 1911, to June 17, 1912, a vertical staff on left bank in sec. 15, T. 6 N., R. 11 W., above the falls in Racetrack Creek; June 18 to November 9, 1912, a vertical staff on left bank, 300 feet farther upstream, and different datum.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Gravel and sand; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.1 feet at 6.30 a. m. June 4 (discharge not computed); minimum stage recorded, 1.30 feet at 7 p. m. September 25–27 (discharge not computed).

1911–1912, 1914: Maximum stage recorded, 6.8 feet June 10–14, 1912 (discharge, 515 second-feet); minimum stage recorded, 2.85 feet February 22, 24, and 26, 1912 (discharge, 16 second-feet).

WINTER FLOW.—Discharge relation affected by ice.

COOPERATION.—Field data furnished by United States Forest Service.

DIVERSIONS.—One small diversion during the irrigation season.

Estimates withheld for additional data.

No discharge measurements made during the year.

Daily gage height, in feet, of Racetrack Creek near Anaconda, Mont., for the year ending Sept. 30, 1914.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1.40	3.20	2.08	1.52	1.34	16.....	.....	.....	2.95	1.70	1.48	1.39
2.....	1.50	3.65	2.05	1.51	1.34	17.....	.....	.....	2.95	1.62	1.48	1.40
3.....	1.60	3.75	1.98	1.50	1.34	18.....	.....	.....	3.05	1.60	1.46	1.39
4.....	1.67	3.90	1.94	1.51	1.34	19.....	.....	2.39	3.10	1.60	1.46	1.38
5.....	1.60	3.75	1.95	1.50	1.32	20.....	.....	2.55	2.95	.....	1.42	1.39
6.....	1.54	3.25	1.85	1.50	1.31	21.....	.....	2.70	.....	.....	1.42	1.39
7.....	1.50	2.90	1.85	1.50	1.31	22.....	.....	2.90	.....	1.55	1.40	1.38
8.....	1.59	2.80	1.82	1.50	1.31	23.....	.....	3.15	2.5	1.56	1.40	1.37
9.....	1.75	2.60	1.80	1.55	1.34	24.....	.....	3.20	2.45	1.56	1.40	1.34
10.....	1.94	2.45	1.80	1.51	1.35	25.....	1.35	3.10	.....	1.56	1.38	1.30
11.....	1.81	2.45	.....	1.51	.....	26.....	1.34	2.95	.....	1.56	1.38	1.30
12.....	1.72	.....	1.75	1.50	.....	27.....	1.38	2.80	2.30	.....	1.38	1.30
13.....	1.70	.....	1.78	1.49	.....	28.....	1.40	2.95	2.22	1.55	1.35	1.31
14.....	1.80	.....	1.78	1.49	.....	29.....	1.37	2.80	2.18	1.56	1.35	1.31
15.....	2.95	1.72	1.48	.....	30.....	1.37	2.80	2.11	1.58	1.35	1.31
							31.....	.....	3.00	.....	1.56	1.35	.....

LITTLE BLACKFOOT RIVER NEAR ELLISTON, MONT.

LOCATION.—In the SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 30, T. 9 N., R. 6 W., about 500 feet below the Little Blackfoot ranger station in the Helena National Forest, and about 5 mile southeast of Elliston.

DRAINAGE AREA.—59 square miles.

RECORDS AVAILABLE.—September 29, 1910, to September 30, 1914.

GAGE.—Vertical staff on left bank.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Gravel and small rocks; probably permanent.

EXTREMES OF STAGE.—Maximum stage recorded during year, 4.8 feet at 5.30 p. m.

May 15, 4 p. m. May 16, and 7 a. m. May 17; minimum stage recorded, 1.5 feet at 7 a. m. August 25.

1910–1914: Maximum stage recorded, 5 feet May 21–22, 1912, and May 28, 1913; minimum stage recorded, 1.08 feet October 1, 1910.

WINTER FLOW.—Discharge relation seriously affected by ice.

DIVERSIONS.—Water for irrigation taken out about half a mile above the ranger station is carried past this point; a gaging station was maintained on this ditch from September, 1910, to September, 1912.

COOPERATION.—Gage-height record furnished by the United States Forest Service.

Measurements insufficient for estimates of discharge.

The following discharge measurement was made by B. E. Jones:

August 16, 1914: Gage height, 1.49 feet; discharge, 10.2 second-feet.

Daily gage height, in feet, of Little Blackfoot River near Elliston, Mont., for the year ending Sept. 30, 1914.

[M. D. Mizner, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Day.	Apr.	May.	June.	July.	Aug.
1.....		3.0		2.28	1.66	16.....		4.8	3.4		1.60
2.....		3.2		2.24		17.....		4.8	3.35		1.54
3.....		3.2		2.24		18.....		4.7	3.3	1.90	1.54
4.....		3.2		2.22		19.....			3.25	1.90	1.54
5.....		3.4		2.20		20.....			3.2		1.54
6.....		3.4		2.18		21.....		4.7			1.52
7.....		3.4		2.14		22.....	2.6	4.6			1.52
8.....		3.5		2.10		23.....	2.8	4.6			1.52
9.....		3.5		2.10		24.....	3.0	4.5			1.52
10.....		4.2		2.06		25.....	3.2	4.5			1.50
11.....		4.0		2.06		26.....	3.2	4.4		1.70	
12.....		4.0		2.04		27.....	3.2	4.4		1.70	
13.....		4.3		2.00		28.....	3.0	4.4		1.68	
14.....		4.6	3.5	2.00		29.....	3.0	4.3		1.66	
15.....		4.8	3.45	2.00		30.....	3.0	4.2	2.3	1.66	
						31.....		4.2		1.66	

WEST FORK OF BITTERROOT RIVER NEAR DARBY, MONT.

LOCATION.—In sec. 27, T. 2 N., R. 21 W., approximately 500 feet downstream from the Trapper Creek ranger station, one-half mile below mouth of Trapper Creek, and 10 miles south of Darby.

DRAINAGE AREA.—572 square miles.

RECORDS AVAILABLE.—September 19, 1910, to September 30, 1914; fragmentary.

GAGE.—Chain on left bank.

DISCHARGE MEASUREMENTS.—Made by wading or from cable.

CHANNEL AND CONTROL.—Small rock; uniform; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.6 feet at 7 a. m.

May 23 (discharge, 3,360 second-feet); minimum stage recorded, 1.85 feet August 28 to September 7, inclusive (discharge, 106 second-feet).

1910-1914: Maximum stage recorded, 7.4 feet May 27, 1913 (discharge, 6,420 second-feet); minimum stage recorded, 1.85 feet August 28 to September 7, 1914, inclusive (discharge, 106 second-feet). Open-season records only; flow may have been lower at times in the winter months.

WINTER FLOW.—Discharge relation seriously affected by ice.

DIVERSIONS.—None.

ACCURACY.—Results fair.

COOPERATION.—Field data furnished by United States Forest Service.

The following discharge measurement was made by E. W. Kramer:

March 5, 1914: Discharge relation affected by ice and gage not read; discharge, 130 second-feet.

Daily discharge, in second-feet, of West Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1914.

Day.	Nov.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	209		340	765	2,170	798	263	106
2.	204		375	1,130	3,050	732	248	106
3.	198		410	1,480	2,750	700	234	106
4.	192		445	1,800	2,600	732	290	106
5.	202	130	480	1,920	2,170	865	252	106
6.	213	145	515	1,220	1,920	670	199	106
7.	217	160	550	1,090	1,390	640	199	106
8.	221	175	575	1,580	1,390	610	190	113
9.	225	190	600	1,920	1,260	580	182	120
10.	227	205	625	2,310	1,170	580	182	120
11.	213	220	650	1,920	1,130	550	172	120
12.	209	235	675	1,800	1,170	550	166	135
13.	209	250	700	1,690	1,300	520	166	135
14.	209	270	725	2,040	1,390	520	166	150
15.	209	290	750	2,170	1,300	465	166	216
16.	209	310	770	2,900	1,480	415	150	227
17.	209	310	790	2,600	1,390	370	135	227
18.	199	310	810	2,750	1,480	370	135	234
19.	202	310	830	2,450	1,480	350	150	290
20.	209	310	1,300	2,600	1,390	392	150	271
21.	210	296	1,170	2,600	1,260	440	135	241
22.	212	282	1,090	2,900	1,010	350	150	216
23.	214	268	1,130	3,200	865	330	135	199
24.	216	254	1,170	3,050	865	318	135	199
25.	213	240	1,090	2,450	1,130	290	135	199
26.	212	226	975	2,310	1,050	290	135	199
27.	210	212	938	2,040	938	271	120	182
28.	209	199	830	2,040	865	271	106	182
29.	202	235	765	1,690	830	271	106	166
30.	202	270	732	1,800	798	271	106	166
31.		305		1,920		271	106	

NOTE.—Discharge determined from a rating curve fairly well defined for 1912 and 1913; no measurements made in 1914. Discharge estimated, owing to lack of gage readings, as follows: Nov. 30, 202 second-feet; Mar. 1-4, 125 second-feet; discharge also estimated, owing to lack of gage readings, Mar. 6-15; discharge interpolated, owing to lack of gage readings, Nov. 2, 3, 5, 7-9, 13-16, 21-23, 26, 27; Mar. 17-19, 21-27, Mar. 29 to Apr. 6; Apr. 8-18, 23; Aug. 2, 8, 27, and Sept. 8.

Monthly discharge of West Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
November.	227	192	210	12,500
March.	310		229	14,100
April.	1,300	340	760	45,200
May.	3,200	765	2,070	127,000
June.	3,050	798	1,430	85,100
July.	865	271	477	29,300
August.	290	106	167	10,300
September.	290	106	168	10,000

NOTE.—Accuracy rating omitted as station was not visited in 1914, and monthly means may be considerably in error, though a rating of "C" is possibly warranted.

EAST FORK OF BITTERROOT RIVER NEAR DARBY, MONT.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 21, T. 2 N., R. 20 W., at Joe Olsen's bridge, in front of the Medicine Tree ranger station, 10 miles from Darby, and 3 miles above junction of East Fork with West Fork.

DRAINAGE AREA.—340 square miles.

RECORDS AVAILABLE.—October 20, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff on pier of bridge.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Large rocks; irregular and probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.9 feet at 9 a. m.

June 4 (discharge, 1,540 second-feet); minimum stage recorded, 2.4 feet at 1 p. m.

March 16, 20, and 31, and at 6 p. m. August 20–24 (discharge, 85 second-feet).

1910–1914: Maximum stage recorded, 7.0 feet May 31, 1913 (discharge, 2,230 second-feet); minimum stage recorded, 2.0 feet December 10–11, 1910 (discharge, 50 second-feet). Open-season records only; flow may have been lower at times during the winter months.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—None of importance.

ACCURACY.—Records good.

COOPERATION.—Field data furnished by United States Forest Service.

The following discharge measurement was made by E. W. Kramer:

November 27, 1913: Gage height, 2.50 feet; discharge, 102 second-feet.

Daily discharge, in second-feet, of East Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1914.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Day.	Mar.	Apr.	May.	June.	July.	Aug.
1.....		94	238	1,080			16.....	85	174	1,060	687	265	94
2.....		102	292	1,300			17.....	85	186	1,120	667	265	94
3.....		120	349	1,300			18.....	85	186	1,080	647	265	94
4.....		140	411	1,540			19.....	85	205	1,140	627	265	94
5.....		162	379	1,020			20.....	85	224	1,190	607	265	85
6.....	85	186	349	965			21.....	85	243	1,240	587	265	85
7.....	88	186	320	965			22.....	85	262	1,300	567	258	85
8.....	91	186	379	890			23.....	85	281	1,360	547	252	85
9.....	94	174	446	810			24.....	85	300	1,360	530	238	85
10.....	97	174	687	760			25.....	85	320	1,300	513	238	.....
11.....	100	162	711	711	265	.....	26.....	85	292	1,240	496	212	.....
12.....	102	162	860	663	265	102	27.....	85	278	1,080	479	186	.....
13.....	98	162	910	663	265	102	28.....	85	265	1,080	462	174	.....
14.....	94	168	960	711	265	102	29.....	85	256	910	446	162	.....
15.....	90	174	1,010	711	265	102	30.....	85	247	910	379	162	.....
							31.....	85	.....	1,000	.....	162	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge estimated, owing to lack of gage readings, as follows: Mar. 1–5, 85 second-feet; July 1–10, 322 second-feet; July 31, 162 second-feet; Aug. 1–11, 130 second-feet; Aug. 25–31, 85 second-feet. Discharge, interpolated owing to lack of gage readings, Mar. 7–11, 13–15, 17–19, and 21–30; Apr. 14, 16, 17, 19–24, 27, 29, and 30; May 12–17, 19–22, 28, and 29. June 8, 10, 13, 14, 17–22 and 24–28; July 17, 22, and 26.

Monthly discharge of East Fork of Bitterroot River near Darby, Mont., for the period March to August, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
March.....	102	85	87.9	5,400	C.
April.....	320	94	202	12,000	C.
May.....	1,360	238	360	52,900	C.
June.....	1,540	379	744	44,300	C.
July.....	.....	162	264	16,200	C.
August.....	.....	.....	104	6,400	C.
The period.....	.....	.....	.....	137,000	

LOLO CREEK NEAR LOLO, MONT.

LOCATION.—In sec. 34, T. 12 N., R. 21 W., at the highway bridge at Anderson's ranch, 7 miles upstream from town of Lolo and from the junction of this creek with the Bitterroot.

DRAINAGE AREA.—249 square miles.

RECORDS AVAILABLE.—April 25, 1911, to September 30, 1914, for station at present site; October 18, 1910, to March 9, 1911, 1 mile below Anderson's ranch; Mill Creek enters between the two sites.

GAGE.—Vertical staff fastened to bridge abutment.

DISCHARGE MEASUREMENTS.—Made by wading or from the bridge.

CHANNEL OR CONTROL.—Rock; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.3 feet at 9.15 a. m. May 25 (discharge, 1,600 second-feet); minimum stage recorded, 1.75 feet at 3.20 p. m. September 4 (discharge, 47 second-feet).

1910-1914: Maximum stage recorded, 5.2 feet May 28, 1913 (discharge, 2,500 second-feet); minimum stage recorded, 1.64 feet March 20, 1912 (discharge, 36 second-feet). Open-season records only, flow may have been lower at times during the winter months.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—Water taken out above station for irrigation on small ranches; below station water is diverted for irrigation on the land adjoining this creek and Bitterroot River.

ACCURACY.—Records good.

COOPERATION.—Field data furnished by United States Forest Service.

The following discharge measurement was made by E. W. Kramer:

February 21, 1914: Gage height, 1.85 feet; discharge 51 second-feet.

Daily discharge, in second-feet, of Lolo Creek near Lolo, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	72	76	78	129	768	1,000	362	122	54
2.....	70	77	79	135	798	970	371	117	52
3.....	68	79	96	141	820	956	380	112	50
4.....	66	81	113	147	842	943	388	106	47
5.....	68	83	130	153	864	915	364	99	51
6.....	71	85	134	158	886	886	340	99	55
7.....	74	83	137	164	908	857	315	99	59
8.....	77	81	142	182	930	829	310	97	63
9.....	80	79	148	200	952	800	305	95	67
10.....	82	82	161	218	974	772	300	93	72
11.....	85	85	174	289	997	715	294	91	74
12.....	84	85	186	360	1,050	721	287	89	76
13.....	83	85	182	431	1,100	727	280	87	78
14.....	82	85	178	502	1,150	733	273	85	79
15.....	81	91	174	570	1,220	739	260	83	81
16.....	80	93	170	638	1,280	727	247	81	83
17.....	79	95	166	669	1,350	715	235	79	84
18.....	78	97	163	700	1,380	700	226	77	85
19.....	77	99	160	736	1,410	685	218	75	87
20.....	76	97	156	762	1,440	670	204	73	89
21.....	75	92	152	793	1,470	654	190	71	91
22.....	74	87	148	825	1,500	638	176	69	95
23.....	73	82	145	857	1,530	602	172	68	99
24.....	72	77	142	836	1,560	566	168	67	101
25.....	72	72	138	815	1,600	530	164	66	104
26.....	72	69	134	794	1,420	495	156	63	106
27.....	72	66	130	772	1,250	460	148	60	106
28.....	72	68	122	761	1,190	424	139	60	106
29.....	73	70	113	750	1,130	388	130	60	106
30.....	74	73	118	739	1,060	375	127	58	106
31.....	75	-----	123	-----	1,030	-----	124	56	-----

NOTE.—Discharge determined from a fairly well-defined rating curve. Gage read an average of 8 times a month, and discharge interpolated for intervening periods.

Monthly discharge of Lolo Creek near Lolo, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	85	66	75.4	4,640	C.
November.....	99	66	82.5	4,910	C.
December.....			75	4,610	D.
January.....			70	4,300	D.
February.....			55	3,050	D.
March.....	186	78	142	8,730	C.
April.....	857	129	508	30,200	C.
May.....	1,600	768	1,160	71,300	C.
June.....	1,000	375	706	42,000	C.
July.....	388	124	247	15,200	C.
August.....	122	56	82.5	5,070	C.
September.....	106	47	80.2	4,770	C.
The year.....	1,600		274	199,000	

NOTE.—Mean discharge for December, January, and February estimated because of ice. Accuracy reduced slightly on account of infrequent gage readings.

ST. REGIS RIVER NEAR ST. REGIS, MONT.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 28, T. 18 N., R. 28 W., at the St. Regis ranger station, approximately 3 miles from the town of St. Regis and the junction with Clark Fork.

DRAINAGE AREA.—278 square miles.

RECORDS AVAILABLE.—September 17, 1910, to September 30, 1914.

GAGE.—Vertical staff on left bank 100 feet below a suspension bridge at ranger station.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Small rock; shallow and probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.5 feet at 8 a. m. and 6 p. m. April 23 and 24 (discharge, 2,970 second-feet); minimum stage recorded, 1.8 feet at 8 a. m. and 6 p. m. October 2-5 and November 1 (discharge, 90 second-feet).

1910-1914: Maximum stage recorded, 7.7 feet May 28, 1913 (discharge, 6,220 second-feet); minimum stage recorded, 1.8 feet, September 15-19, 27-30, October 2-5, November 1, 1913 (discharge, 90 second-feet).

Open-season records only; flow may have been lower at times during the winter months.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—None.

ACCURACY.—Results good.

COOPERATION.—Gage-height records furnished by United States Forest Service.

The following discharge measurements was made by W. A. Lamb: September 20 1914: Gage height, 2.00 feet; discharge, 137 second-feet.

Daily discharge, in second-feet, of St. Regis River near St. Regis, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	105	90	.....	580	1,790	970	330	150	150
2.....	90	105	.....	610	2,120	1,040	330	150	150
3.....	90	120	.....	640	2,710	1,120	330	150	150
4.....	90	150	.....	670	2,350	970	310	150	150
5.....	90	185	.....	830	2,120	865	310	150	150
6.....	105	185	.....	830	1,790	830	310	150	150
7.....	105	185	238	1,300	1,690	765	262	150	150
8.....	105	185	272	1,590	1,690	732	255	150	150
9.....	105	185	310	1,690	1,790	765	255	135	150
10.....	135	185	375	1,590	2,350	798	248	126	150
11.....	185	168	375	1,690	2,350	732	238	120	150
12.....	172	150	375	1,790	2,350	700	238	120	150
13.....	159	168	398	1,790	2,230	765	238	120	150
14.....	146	135	470	1,900	2,350	700	238	135	150
15.....	133	120	640	2,350	2,350	610	238	150	150
16.....	120	120	765	2,350	2,470	552	238	150	150
17.....	120	120	1,010	2,120	2,350	470	220	150	150
18.....	105	185	1,120	1,900	2,120	420	220	150	150
19.....	105	185	1,040	2,010	2,010	420	220	150	150
20.....	120	185	970	2,120	1,900	420	202	150	150
21.....	105	175	798	2,120	1,790	375	202	150	150
22.....	135	160	765	2,350	1,790	420	202	150	330
23.....	150	150	830	2,840	1,690	445	185	150	330
24.....	168	160	765	2,840	1,690	420	185	150	330
25.....	150	175	765	2,590	1,490	375	168	150	330
26.....	135	185	670	2,350	1,490	375	168	150	330
27.....	120	185	610	2,120	1,300	375	150	150	330
28.....	135	185	552	1,900	1,300	375	150	150	330
29.....	105	185	498	1,590	1,210	375	150	150	330
30.....	105	185	525	1,490	1,120	330	150	150	330
31.....	126	.....	580	.....	1,040	.....	150	150	.....

NOTE.—Discharge determined from a fairly well-defined rating curve. Discharge interpolated for lack of gage readings Oct. 12–15, Nov. 7–9, 19, 21, 22, 24, 25, 27, 28. Discharge estimated, 185 second-feet Nov. 30, for lack of gage reading.

Monthly discharge of St. Regis River near St. Regis, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	185	90	123	0.442	0.51	7,560	B.
November.....	185	90	162	.583	.65	9,640	B.
March 7–31.....	1,102	238	629	2.26	2.10	31,200	B.
April.....	2,840	580	1,750	6.29	7.02	104,000	B.
May.....	2,710	1,040	1,900	6.83	7.87	117,000	B.
June.....	1,120	330	617	2.22	2.45	36,700	B.
July.....	330	150	229	.824	.95	14,100	B.
August.....	150	120	145	.522	.60	8,920	B.
September.....	330	150	204	.734	.82	12,100	C.

NORTH FORK OF FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

LOCATION.—In sec. 7, T. 31 N., R. 19 W., at Potter's ranch, three-fourths mile above junction with Middle Fork of Flathead River, and about 10 miles northeast of Columbia Falls.

DRAINAGE AREA.—1,620 square miles.

RECORDS AVAILABLE.—September 22, 1910, to September 30, 1914.

GAGE.—Vertical staff on right bank near ranch buildings.

DISCHARGE MEASUREMENTS.—Made from cable about three-fourths mile above gage.

CHANNEL AND CONTROL.—Rocky; clean and practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.8 feet at 7 a. m. and 6 p. m. June 4 (discharge 13,300 second-feet); minimum stage recorded, 0.7 foot at 7 a. m. and 6 p. m. February 5-6 (discharge 350 second-feet).

1910-1914: Maximum stage recorded, 8.7 feet June 2, 1913 (discharge, 23,800 second-feet); minimum stage recorded, 0.7 foot November 10, 1911, and February 5-6, 1914 (discharge, 350 second-feet).

WINTER FLOW.—Channel open at the control during winter; discharge relation affected by anchor ice for short periods.

ACCURACY.—Results excellent, except for short periods during winter.

No discharge measurements made during the year.

Daily discharge, in second-feet, of North Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,000	1,140	960	1,050	675	640	790	4,620	8,540	4,840	1,670	1,240
2.....	960	1,140	960	960	570	640	790	6,220	11,100	4,620	1,670	1,240
3.....	960	1,140	960	960	570	640	790	8,540	12,400	4,620	1,620	1,140
4.....	960	1,140	960	960	400	640	870	9,220	13,300	4,620	1,620	1,140
5.....	960	1,140	960	1,050	350	570	1,100	7,900	11,900	4,840	1,560	1,140
6.....	960	1,240	960	1,140	350	570	1,450	6,700	10,300	4,840	1,560	1,140
7.....	960	1,240	870	1,340	400	570	1,560	5,740	8,540	4,620	1,560	1,140
8.....	960	1,140	870	1,140	425	570	1,620	5,740	7,300	4,400	1,560	1,140
9.....	960	1,140	710	1,050	605	570	1,670	6,700	6,460	4,040	1,450	1,140
10.....	960	1,140	570	1,050	710	570	1,730	8,540	5,740	3,860	1,400	1,140
11.....	960	1,140	570	1,050	790	570	1,910	8,540	5,500	3,680	1,340	1,140
12.....	1,050	1,140	640	1,050	710	570	2,330	7,900	5,500	3,500	1,340	1,140
13.....	1,050	1,140	790	960	790	570	2,640	7,900	5,740	3,320	1,340	1,140
14.....	1,560	1,140	790	960	790	570	2,970	8,540	6,700	3,500	1,240	1,140
15.....	1,670	1,140	790	960	790	640	3,500	9,560	7,000	3,320	1,240	1,140
16.....	1,620	1,050	790	960	710	640	3,860	10,700	7,300	3,320	1,240	1,140
17.....	1,560	1,140	790	870	710	640	3,680	11,500	7,900	2,970	1,400	1,240
18.....	1,450	1,240	790	790	710	640	3,680	11,500	8,540	2,800	1,730	1,340
19.....	1,340	1,240	790	870	640	790	3,680	10,700	8,540	2,640	1,850	1,500
20.....	1,340	1,240	870	870	640	790	4,840	10,300	7,900	2,480	1,670	1,790
21.....	1,340	1,100	790	870	640	710	4,840	9,900	7,000	2,480	1,620	1,910
22.....	1,340	960	790	790	640	710	4,840	9,560	6,220	2,330	1,560	1,910
23.....	1,240	960	790	570	640	710	4,840	9,900	5,500	2,180	1,560	1,790
24.....	1,240	960	790	570	640	710	5,280	10,700	5,060	2,040	1,560	1,670
25.....	1,240	960	790	675	640	570	5,280	12,400	5,280	2,040	1,560	1,670
26.....	1,340	960	790	790	640	510	4,840	11,100	5,740	1,910	1,450	1,670
27.....	1,340	960	790	790	640	605	4,620	9,560	5,280	1,910	1,340	1,670
28.....	1,340	960	790	605	640	750	4,620	8,540	5,280	1,790	1,240	1,670
29.....	1,340	960	790	640	.....	790	4,400	7,600	5,060	1,790	1,240	1,560
30.....	1,240	960	790	790	.....	790	4,220	7,000	4,840	1,790	1,240	1,560
31.....	1,140	.....	790	790	.....	790	.....	7,300	.....	1,730	1,240	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge relation for January and February probably slightly affected by ice.

Monthly discharge of North Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	1,670	960	1,210	74,400	A.
November.....	1,240	960	1,100	65,500	A.
December.....	960	570	809	49,700	B.
January.....	1,340	570	901	55,400	C.
February.....	790	350	623	34,600	B.
March.....	790	510	647	39,800	B.
April.....	5,280	790	3,110	185,000	A.
May.....	12,400	4,620	8,730	537,000	A.
June.....	13,300	4,840	7,380	439,000	A.
July.....	4,840	1,730	3,190	196,000	A.
August.....	1,850	1,240	1,470	90,400	A.
September.....	1,910	1,140	1,380	82,100	A.
The year.....	13,300	350	2,550	1,850,000	

FLATHEAD LAKE AT POLSON, MONT.

LOCATION.—At the steamboat dock at Polson, at the southern extremity of the lake.

RECORDS AVAILABLE.—August 23, 1908, to September 30, 1914.

GAGE.—Vertical staff attached to a pile at the extreme end of the pier; datum 2,800 feet above sea level.

EXTREMES OF STAGE.—Maximum stage recorded during year, 86.8 feet at 12 m. June 5 and 6; minimum stage recorded, 79.2 feet at 12 m. February 22 to March 17.

1908-1914: Maximum stage recorded, 92.5 feet June 11 and 12, 1913; minimum stage recorded, 78.5 feet February 16-22, 1913.

Daily gage height of Flathead Lake at Polson, Mont., for the year ending Sept. 30, 1914.

[J. M. Mettler, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	80.0	79.8	80.0	79.4	79.3	79.2	79.4	82.7	86.5	84.6	81.4	80.2
2.....	80.0	79.9	80	79.4	79.3	79.2	79.4	82.8	86.5	84.5	81.3	80.1
3.....	79.9	79.9	80	79.4	79.3	79.2	79.4	83.0	86.6	84.4	81.2	80.1
4.....	79.9	79.9	80.0	79.4	79.3	79.2	79.4	83.2	86.7	84.3	81.2	80.1
5.....	79.9	79.9	79.9	79.4	79.3	79.2	79.5	83.5	86.8	84.2	81.1	80.0
6.....	79.8	79.9	79.9	79.4	79.3	79.2	79.5	83.7	86.8	84.1	81.0	80.0
7.....	79.8	79.9	79.9	79.4	79.3	79.2	79.5	83.7	86.7	84.0	80.9	80.0
8.....	79.8	79.9	79.9	79.4	79.3	79.2	79.6	83.8	86.7	83.9	80.8	79.9
9.....	79.7	79.9	79.9	79.4	79.3	79.2	79.7	83.8	86.6	83.8	80.7	79.9
10.....	79.7	80.0	79.9	79.4	79.3	79.2	79.7	83.9	86.6	83.7	80.7	79.9
11.....	79.7	80	79.8	79.3	79.3	79.2	79.8	84.0	86.5	83.6	80.7	79.8
12.....	79.6	80	79.8	79.3	79.3	79.2	79.9	84.2	86.4	83.5	80.7	79.8
13.....	79.6	80	79.7	79.3	79.3	79.2	80.0	84.3	86.3	83.4	80.7	79.8
14.....	79.7	80	79.7	79.3	79.3	79.2	80.1	84.4	86.2	83.3	80.7	79.8
15.....	79.7	80	79.7	79.3	79.3	79.2	80.2	84.5	86.1	83.2	80.7	79.8
16.....	79.7	80	79.7	79.3	79.3	79.2	80.4	84.7	86.0	83.1	80.7	79.8
17.....	79.7	80	79.7	79.4	79.3	79.2	80.5	85.0	85.9	83.0	80.7	79.8
18.....	79.7	80	79.7	79.4	79.3	79.3	80.7	85.3	85.8	82.9	80.6	79.8
19.....	79.7	80	79.7	79.4	79.3	79.3	80.8	85.6	85.7	82.8	80.6	79.8
20.....	79.7	80	79.7	79.4	79.3	79.3	81.0	85.8	85.6	82.7	80.6	79.8
21.....	79.7	80	79.7	79.4	79.3	79.3	81.3	86.0	85.5	82.5	80.6	79.8
22.....	79.7	80	79.7	79.4	79.2	79.3	81.5	86.0	85.4	82.4	80.6	79.8
23.....	79.7	80.0	79.6	79.4	79.2	79.3	81.6	86.0	85.3	82.3	80.5	79.9
24.....	79.8	80.1	79.6	79.4	79.2	79.3	81.8	86.1	85.2	82.2	80.5	79.9
25.....	79.8	80.1	79.6	79.4	79.2	79.3	82.0	86.2	85.1	82.1	80.5	79.9
26.....	79.8	80.0	79.6	79.4	79.2	79.3	82.2	86.4	85.0	82.0	80.4	79.9
27.....	79.9	80	79.6	79.4	79.2	79.3	82.4	86.5	85.0	81.9	80.4	79.8
28.....	79.9	80	79.5	79.4	79.2	79.3	82.5	86.5	84.9	81.8	80.3	79.8
29.....	79.9	80	77.5	79.4	-----	79.3	82.6	86.6	84.8	81.7	80.3	79.9
30.....	79.8	80	79.5	79.4	-----	79.3	82.7	86.6	84.7	81.6	80.2	79.9
31.....	79.8	-----	79.5	79.4	-----	79.4	-----	86.5	-----	81.5	80.2	-----

FLATHEAD RIVER NEAR POLSON, MONT.

LOCATION.—At Mishell's ferry, 2½ miles below Newell tunnel, 12 miles below Polson, and 15 miles northwest of Ronan.

DRAINAGE AREA.—7,010 square miles.

RECORDS AVAILABLE.—July 23, 1907, to September 30, 1914.

GAGE.—Chain on right bank 80 feet above ferry.

DISCHARGE MEASUREMENTS.—Made from car on ferry cable.

CHANNEL AND CONTROL.—Small boulders; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.4 feet at 10 a. m. May 26 (discharge, 41,000 second-feet); minimum stage recorded, 1.5 feet at 10 a. m. January 28 (discharge, 2,400 second-feet).

1907-1914: Maximum stage recorded, 16.4 feet June 12, 1913 (discharge, 75,400 second-feet), minimum stage recorded, 1.2 feet December 29 and 30, 1912 (discharge, 2,150 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS—Some small diversions from tributaries above Flathead Lake.

ACCURACY.—Rating curve well defined.

The following discharge measurement was made by W. A. Lamb:

May 16, 1914.

Gage height, 8.47 feet; discharge, 24,700 second-feet.

Daily discharge, in second-feet, of Flathead River near Polson, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	4,330	4,330	4,500	3,120	3,010	3,010	3,230	14,800	35,200	22,000	9,620	4,670
2.....	4,170	4,170	4,330	3,230	3,010	2,900	3,230	14,800	36,500	21,000	9,310	4,850
3.....	4,020	4,020	4,500	3,230	3,010	2,900	3,230	14,400	33,400	21,000	8,110	4,500
4.....	4,020	4,170	4,330	3,230	3,010	2,900	3,230	16,600	35,200	20,500	9,000	4,500
5.....	3,880	3,880	4,170	3,230	3,010	3,010	3,230	17,500	34,600	20,000	8,400	4,170
6.....	3,880	4,020	4,170	3,230	3,010	3,010	3,470	18,000	35,200	20,000	8,400	4,330
7.....	3,880	4,170	3,880	3,120	3,010	3,010	3,600	19,500	36,500	17,500	8,400	4,500
8.....	3,880	4,020	4,020	3,120	3,010	3,010	3,880	19,500	34,600	19,000	7,820	4,170
9.....	3,740	4,170	3,880	3,120	3,010	2,900	3,880	19,000	35,200	18,500	8,110	4,020
10.....	3,740	4,330	3,880	3,230	3,010	2,900	3,880	20,500	32,800	18,500	7,270	3,740
11.....	3,470	4,330	3,740	3,230	3,010	2,900	4,170	21,000	33,400	17,500	7,540	3,740
12.....	3,350	4,170	3,740	3,230	3,010	2,900	4,330	21,500	32,200	17,100	7,010	3,880
13.....	3,230	4,500	3,740	3,230	3,010	2,790	4,670	22,000	31,000	16,200	6,760	3,740
14.....	3,230	4,330	3,600	3,230	3,010	2,790	4,850	23,100	29,800	15,300	6,760	3,880
15.....	3,470	4,170	3,600	2,900	3,010	2,690	4,850	24,700	29,300	14,800	6,290	3,880
16.....	3,600	4,170	3,600	3,350	3,010	2,690	5,430	24,700	29,300	15,700	6,060	3,740
17.....	3,600	4,020	3,600	3,230	3,010	2,900	6,060	25,300	28,700	15,300	6,060	3,880
18.....	3,600	4,170	3,600	3,120	3,010	2,790	7,540	27,500	28,700	14,800	6,520	3,880
19.....	3,740	4,170	3,600	3,230	3,010	2,790	7,540	27,500	28,100	14,400	6,060	3,740
20.....	3,740	4,170	3,600	3,350	3,010	2,790	7,540	29,800	28,700	13,200	6,060	3,740
21.....	3,740	4,330	3,350	3,230	3,010	3,010	9,000	34,000	27,500	13,200	5,840	3,880
22.....	3,600	4,500	3,470	3,120	3,010	2,790	10,200	37,100	27,500	12,800	5,630	3,880
23.....	3,600	4,170	3,350	3,120	3,010	2,790	19,900	37,800	26,400	12,400	6,060	3,880
24.....	3,740	4,500	3,350	3,350	3,010	2,790	11,300	39,000	25,800	12,000	5,630	3,880
25.....	3,880	4,500	3,350	3,230	3,010	2,790	11,300	40,300	25,800	11,300	5,430	4,020
26.....	3,880	4,330	3,230	3,010	3,010	2,790	12,400	41,000	25,300	11,300	5,230	4,020
27.....	4,500	4,500	3,230	2,900	2,790	2,790	13,600	36,500	24,200	10,900	5,230	4,170
28.....	4,020	4,330	3,230	2,400	3,010	3,010	14,000	33,400	23,600	10,600	5,040	4,170
29.....	4,020	4,330	3,230	2,490	.....	3,010	14,400	33,400	23,100	9,930	5,040	4,020
30.....	4,170	4,170	3,230	2,790	.....	3,010	14,000	36,500	23,600	9,930	4,020	3,880
31.....	4,170	.....	3,230	3,120	.....	3,120	.....	36,500	.....	9,930	4,020	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge relation apparently affected by ice, discharge interpolated, Feb. 2-4, 6-7, and Mar. 25-29.

Monthly discharge of Flathead River near Polson, Mont., for the year ending Sept. 30, 1914.

[Drainage area, 7,010 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	4,330	3,230	3,800	0.542	0.62	234,000	B.
November	4,500	3,880	4,240	.605	.68	252,000	B.
December	4,500	3,230	3,690	.526	.61	227,000	B.
January	3,350	2,400	3,120	.445	.51	192,000	B.
February	3,010	2,790	3,000	.428	.45	167,000	B.
March	3,120	2,690	2,890	.412	.48	178,000	B.
April	14,400	3,230	7,100	1.01	1.13	422,000	A.
May	41,000	14,400	26,700	3.81	4.39	1,640,000	A.
June	36,500	23,100	30,000	4.28	4.78	1,790,000	A.
July	22,000	9,930	15,400	2.20	2.54	947,000	A.
August	9,620	4,020	6,670	.951	1.10	410,000	A.
September	4,850	3,740	4,040	.576	.64	240,000	A.
The year	41,000	2,400	9,250	1.32	17.93	6,700,000	

MIDDLE FORK OF FLATHEAD RIVER AT BELTON, MONT.

LOCATION.—South line of sec. 25, T. 32 N., R. 18 W., at Hotel Belton, one-half mile below the highway bridge at Belton; about 2 miles above junction of Lake McDonald outlet.

DRAINAGE AREA.—900 square miles.

RECORDS AVAILABLE.—October 15, 1910, to September 30, 1914.

GAGE.—Sloping gage on the left bank directly back of Hotel Belton.

DISCHARGE MEASUREMENTS.—Made from a cable 200 feet below the gage.

CHANNEL AND CONTROL.—Practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.2 feet at 4.30 p. m. May 17 (discharge, 11,500 second-feet); minimum stage recorded, 1.85 feet at 11.35 a. m. December 21 (discharge, 432 second-feet).

1910-1914: Maximum stage recorded, 13.9 feet May 27, 1913 (discharge, 26,900 second-feet); minimum stage recorded, 1.3 feet March 29-30, 1912 (discharge, 182 second-feet).

WINTER FLOW.—Steam freezes over at gage for short periods during winter months, but is open at control section below gage.

ACCURACY.—Results excellent; winter records probably reliable except for short periods during extremely cold weather.

The following discharge measurement was made by W. A. Lamb:

December 13, 1913: Gage height, 2.56 feet; discharge, 639 second-feet.

43855°—wsp 392—16—5

Daily discharge, in second-feet, of Middle Fork of Flathead River at Belton, Mont., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Sept.
1.		710	420		400	830	6,190	7,250	
2.		650	440		420	830	6,820	9,540	
3.		590	485		420	830	7,470	10,000	
4.		510	440		400	830	7,250	8,600	
5.		510	440		400	1,400	6,400	7,250	
6.		510			400	1,870	5,190	5,980	
7.		485			400	1,870	4,630	4,880	
8.		485			420	1,870	5,000	3,770	
9.		485			400	1,870	7,470		
10.		510			400	1,870	8,140		
11.		650			380	2,410	7,690		
12.	1,020	535			420	2,650	6,610		
13.	960	485			535	2,770	6,190		
14.	960	440			650	3,170	7,470		485
15.	830	485			710	3,610	7,910		510
16.	830	485			800	3,930	9,300		510
17.	960	400			830	4,450	11,500		510
18.	1,100	400		440	928	4,450	10,300		510
19.	1,100	650		400	960	4,810	9,500		1,160
20.	1,020	400		400	960	5,980	8,700		1,240
21.		960	342	400	960	6,190	7,910		1,020
22.		960	360	400	960	6,190	7,470		535
23.		895	620	400	960	6,190	7,250		535
24.		830	485	420	960	5,980	6,610		535
25.		830	510	400	895	6,190	8,600		535
26.		830	510	420	650	5,190	7,690		535
27.		770	440	400	770	4,810	5,980		535
28.		710	440	400	830	4,450	6,190		510
29.		710	420		830	5,190	5,580		510
30.		650	380		830	5,780	5,580		510
31.			400		830		7,690		

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated, owing to lack of gage readings, May 19 and 20, and June 7. Discharge relation affected by ice Jan. 6 to Feb. 17; discharge estimated as follows: Jan. 6-31, 420 second-feet; Feb. 1-17, 400 second-feet.

Monthly discharge of Middle Fork of Flathead River at Belton, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
November 12-31.	1,100	650	891	33,600	A.
December.	710	342	493	30,700	B.
January.			424	26,100	C.
February.			403	22,400	C.
March.	960	380	668	41,100	A.
April.	6,190	830	3,620	215,000	A.
May.	11,500	4,630	7,300	449,000	A.
June 1-8.	10,000	3,770	7,160	114,000	A.
September 14-30.	1,240	485	628	21,200	A.

LAKE McDONALD OUTLET AT LAKE McDONALD, MONT.

LOCATION.—In the NW. $\frac{1}{4}$ sec. 23, T. 32 N., R. 19 W., at lower end of Lake McDonald, in Glacier National Park.

DRAINAGE AREA.—174 square miles.

RECORDS AVAILABLE.—August 10, 1912, to September 30, 1914 (fragmentary).

GAGE.—Staff at new highway bridge, installed June 8, 1913. Prior to that date gage was located at a bridge about 100 feet upstream which was torn down in spring of 1913. New gage at same datum as old, but does not read the same because of the difference in channel conditions.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and cobblestones; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.2 feet at 5.30 p. m. June 4 (discharge, 2,100 second-feet); minimum stage recorded, 0.9 foot at 2.30 p. m. September 18 (discharge, 230 second-feet).

1912-1914: Maximum stage recorded, 6.25 feet April 28, 1913 (discharge, 3,650 second-feet); minimum stage recorded, 0.97 foot October 9-13, 1912 (discharge, 181 second-feet). Open-season records only; flow may have been lower at times during the winter months.

WINTER FLOW.—Discharge relation probably affected by ice; no records.

ACCURACY.—Results good.

COOPERATION.—Gage-height records furnished by officials of Glacier National Park.

Data insufficient for estimates of monthly discharge.

Discharge measurements of Lake McDonald outlet at Lake McDonald, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 19.....	3.70	1,880	July 25.....	1.46	467
June 18.....	3.43	1,440	Sept. 12.....	0.80	167

Daily discharge, in second-feet, of Lake McDonald outlet at Lake McDonald, Mont., for the year ending Sept. 30, 1914.

May 8.....	1,000	May 20.....	1,870	June 1.....	1,590
9.....	1,000	21.....	1,870	2.....	1,940
10.....	1,120	22.....	1,940	3.....	2,020
11.....	1,180	23.....	2,100	4.....	2,100
12.....	1,120	25.....	1,940	5.....	2,020
13.....	1,180	26.....	1,800	6.....	1,940
14.....	1,240	27.....	1,700	7.....	1,660
15.....	1,380	28.....	1,590	Sept. 18.....	230
16.....	1,520	29.....	1,590	19.....	265
17.....	1,660	30.....	1,520	21.....	410
18.....	1,800	31.....	1,660		

NOTE.—Discharge determined from a poorly defined rating curve.

SOUTH FORK OF FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

LOCATION.—In the NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 4, T. 30 N., R. 19 W., at highway bridge half a mile above junction with Flathead River and about 7 miles east of Columbia Falls.

DRAINAGE AREA.—1,640 square miles.

RECORDS AVAILABLE.—September 20, 1910, to September 30, 1914 (no gage-height record for 1910).

GAGE.—Chain on right span of bridge.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Channel gravel and small rock; control probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.6 feet at 6 p. m. May 17 (discharge, 22,200 second-feet); minimum stage recorded, 3.05 feet at 10 a. m. October 1 (discharge, 520 second-feet).

1910-1914: Maximum stage recorded, 14.8 feet June 3, 1913 (discharge, 39,000 second-feet); minimum stage recorded, 3.05 feet October 1, 1913 (discharge, 520 second-feet.)

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—None.

ACCURACY.—Probably affected by logs lodging on banks and control and by back-water from Flathead River; rating curve fairly well defined.

COOPERATION.—Gage-height record and some discharge measurements furnished by United States Forest Service.

The following discharge measurement was made by W. A. Lamb:

December 12, 1913: Gage height, 1.60 feet; discharge, 756 second-feet.

Daily discharge, in second-feet, of South Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1914.

Oct. 1.....	520	Apr. 30.....	5,290	June 17.....	10,200
6.....	785	May 3.....	11,600	30.....	5,030
16.....	1,110	11.....	10,900	July 11.....	3,380
17.....	1,360	17.....	22,200	Aug. 17.....	940
Apr. 5.....	5,290	28.....	12,300	Sept. 15.....	645
26.....	6,410	June 6.....	13,700	20.....	4,290

NOTE.—Discharge determined from a fairly well-defined rating curve.

LITTLE BITTERROOT RIVER NEAR MARION, MONT.

LOCATION.—In T. 27 N., R. 24 W., at log bridge just below outlet of Little Bitterroot Lake, near Marion.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to post near middle of stream.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.45 feet at 7 p. m. May 10, 12, and 14 (discharge, 11.9 second-feet); minimum stage recorded, 0.55 foot at 4 p. m. July 31, August 1, 3, 5, 7, 13-31 (discharge, 0.6 second-foot).

1910-1914: Maximum stage recorded, 2.9 feet May 24, 1910 (discharge, 43 second-feet); minimum stage recorded, 0.55 foot August 1, 3, 5, 7, 9, 1913, and July 31, August 1, 3, 5, 7, 13-31, 1914 (discharge, 0.6 second-foot).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSION.—None.

REGULATION.—Flow regulated to some extent by temporary dams at outlet of Little Bitterroot Lake.

ACCURACY.—Results fair.

Discharge measurements of Little Bitterroot River near Marion, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 21.....	0.72	1.9	June 17.....	1.15	7.9
May 17.....	1.40	10.4	July 27.....	.68	1.5

Daily discharge, in second-feet, of Little Bitterroot River near Marion, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	2.6	1.5	1.5	5.0	10.3	7.3	8.0	0.6	0.8
2.....	2.6	1.5	1.5	5.0	10.3	7.6	8.0	.6	.8
3.....	2.6	1.5	1.5	5.0	10.3	8.0	8.0	.6	.8
4.....	2.6	1.5	1.5	5.0	10.3	9.2	8.0	.6	.8
5.....	2.4	1.5	1.5	5.0	10.3	10.3	8.0	.6	.8
6.....	2.2	1.5	1.5	5.2	10.3	9.9	8.0	.6	.8
7.....	2.2	1.5	1.4	5.2	10.7	9.5	8.0	.6	.8
8.....	2.2	1.5	1.2	5.2	11.1	9.2	8.0	.6	.8
9.....	2.2	1.5	1.2	5.2	11.5	8.8	8.0	.8	.8
10.....	2.2	1.5	1.2	5.2	11.9	8.0	7.0	.8	.8
11.....	2.2	1.5	1.2	5.6	11.9	7.3	5.9	.8	.8
12.....	2.2	1.5	1.2	5.9	11.9	7.3	5.6	.7	.8
13.....	2.0	1.5	1.2	6.2	11.9	7.3	5.2	.6	.8
14.....	1.8	1.5	1.2	6.6	11.9	7.3	5.2	.6	.8
15.....	1.8	1.5	1.2	6.6	11.5	7.3	5.2	.6	.8
16.....	1.8	1.5	1.2	6.6	11.1	7.3	4.5	.6	.8
17.....	1.8	1.5	1.2	6.6	11.1	7.3	3.8	.6	.8
18.....	1.8	1.5	1.2	6.6	11.1	6.6	3.5	.6	.8
19.....	1.6	1.5	1.2	7.3	10.7	5.9	3.2	.6	.8
20.....	1.5	1.5	1.2	8.0	10.3	5.6	2.6	.6	.8
21.....	1.5	1.5	1.2	8.0	10.3	5.2	2.6	.6	.8
22.....	1.5	1.5	1.2	8.0	10.3	5.2	2.4	.6	.8
23.....	1.5	1.5	1.2	8.4	10.7	5.2	2.1	.6	.8
24.....	1.5	1.5	1.2	8.8	11.1	5.9	1.8	.6	.8
25.....	1.5	1.5	1.0	8.8	10.3	6.6	1.6	.6	.8
26.....	1.5	1.5	.8	8.8	9.5	7.0	1.6	.6	.8
27.....	1.5	1.5	.8	9.6	9.5	7.3	1.6	.6	1.0
28.....	1.5	1.5	.8	10.3	9.5	7.6	1.2	.6	1.2
29.....	1.5	1.5	.8	10.3	8.4	8.0	.8	.6	1.2
30.....	1.5	1.5	.8	10.3	7.3	8.0	.7	.6	1.2
31.....	1.5	.....	.8	.....	7.3	.....	.6	.6	.....

NOTE.—Daily discharge determined from two fairly well-defined rating curves applicable as follows: Oct. 1 to Dec. 31, and Apr. 6 to Sept. 30. Discharge estimated Apr. 1-5.

Gage read on alternate days and discharge interpolated for intervening days.

Monthly discharge of Little Bitterroot River near Marion, Mont., for the year ending Sept. 30, 1914.

Month	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2.6	1.5	1.90	117	C.
November.....	1.5	1.5	1.50	89	
December.....	1.5	.8	1.18	73	
April.....	10.3	5.0	6.94	413	C.
May.....	11.9	7.3	10.5	646	B.
June.....	10.3	5.2	7.43	442	B.
July.....	8.0	.6	4.54	279	C.
August.....	.8	.6	.62	38	
September.....	1.2	.8	.85	51	

LITTLE BITTERROOT RIVER NEAR HUBBART, MONT.

LOCATION.—Above the canyon leading to the second fall of the Little Bitterroot, $1\frac{1}{2}$ miles west of the ranch buildings of the Hubbard Cattle Co., near Hubbard post office and 15 miles south of Marion.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 22, 1909, to September 30, 1914.

GAGE.—Vertical staff. From April 22 to October 17, 1909, the gage was located in box canyon below the falls, about 1 mile downstream. The relation between gages at the two locations was not determined.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL.—Shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.05 feet at 7 p. m.

April 8 (discharge, 61 second-feet); minimum stage recorded, 1.0 foot at 7.30 p. m. August 15, September 1 and 5 (discharge, 2 second-feet).

1909-1914: Maximum stage recorded, 4.00 feet March 22, 1910 (discharge, 206 second-feet); minimum stage recorded, 1.0 foot August 15, September 1 and 5, 1914 (discharge, 2 second-feet). Open-season records only.

DIVERSIONS.—None.

REGULATION.—Flow affected slightly by storage in Little Bitterroot Lake, 15 miles above.

WINTER FLOW.—Discharge relation affected by ice.

ACCURACY.—Results fair.

Discharge measurements of Little Bitterroot River near Hubbard, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	Sec.-ft.		Feet.	Sec.-ft.		Feet.	Sec.-ft.
Oct. 21.....	1.22	8.6	May 18.....	2.45	75	July 27.....	1.29	9.1
Mar. 19.....	1.19	13	June 17.....	1.43	25			

Daily discharge, in second-feet, of Little Bitterroot River near Hubbard, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	10	6	23	.....	26	16	8	2
2.....	10	7	23	.....	25	15	7	2
3.....	10	8	23	.....	25	14	6	2
4.....	10	8	32	.....	24	15	6	2
5.....	10	8	40	.....	24	16	6	2
6.....	11	9	47	.....	24	17	6	2
7.....	11	10	54	.....	23	18	6	3
8.....	11	9	61	.....	22	18	6	3
9.....	11	8	57	.....	22	17	6	3
10.....	11	7	53	.....	23	16	5	3
11.....	11	6	54	.....	24	15	5	3
12.....	11	6	55	.....	25	14	4	3
13.....	11	7	55	.....	26	14	3	3
14.....	11	8	50	.....	26	13	3	3
15.....	11	.....	44	.....	24	13	2	3
16.....	12	.....	45	.....	24	12	3	3
17.....	12	.....	46	.....	25	12	4	3
18.....	12	.....	49	75	25	11	5	3
19.....	12	.....	52	64	22	11	5	3
20.....	12	.....	56	52	22	11	5	3
21.....	12	.....	52	48	22	11	4	3
22.....	12	.....	48	44	22	11	4	3
23.....	12	.....	48	40	22	10	4	3
24.....	12	.....	49	39	22	10	3	3
25.....	11	.....	50	38	21	10	3	2
26.....	10	.....	50	36	20	9	3	2
27.....	9	.....	52	35	20	9	3	2
28.....	8	.....	53	33	20	8	3	2
29.....	8	.....	48	32	19	8	3	2
30.....	7	.....	42	30	18	8	3	2
31.....	6	.....	.....	28	.....	8	2	.....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 14, from a fairly well-defined rating curve; Apr. 1 to Sept. 30, by indirect method for shifting channels, gage read 4 to 12 times a month, and discharge interpolated for intervening periods. Discharge estimated, for lack of gage readings: May 1-17, 50 second-feet.

Monthly discharge of Little Bitterroot River near Hubbard, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	12	6	10.5	646	D.
November 1-14.....	10	6	7.6	211	D.
April.....	61	23	47.0	2,800	C.
May.....	.....	28	46.6	2,870	D.
June.....	26	18	22.9	1,360	C.
July.....	18	8	12.6	775	C.
August.....	8	2	4.4	271	C.
September.....	3	2	2.6	155	.....

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

CROW CREEK NEAR RONAN, MONT.

LOCATION.—At old highway bridge about one-fourth mile above present bridge on the stage road from St. Ignatius to Ronan, 4 miles south of Ronan, and above mouth of Spring Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 21, 1906, to September 30, 1914.

GAGE.—Staff gage on center pier of highway bridge. Gage on left abutment, read Sept. 21, 1906, to Sept. 7, 1913; datum unchanged.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Shifts at high stages; current sluggish.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6 feet at 7 p. m. June 2 (discharge, 367 second-feet); minimum stage recorded, 0.4 foot at 7 a. m. and 7 p. m. September 2–10, 27, and 28 (discharge, 33 second-feet).

1906–1914: Maximum stage recorded, 10.85 feet June 6, 1908 (discharge, 1,400 second-feet); minimum stage recorded, 0.8 foot September 27, 1910 (discharge, 14 second-feet).

Open-season records; flow may have been lower at times during the winter season.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—About 12,400 acre-feet diverted for irrigation above station.

ACCURACY.—Results fair.

Discharge measurements of Crow Creek near Ronan, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
1911.	<i>Feet.</i>	<i>Sec.-ft.</i>	1912.	<i>Feet.</i>	<i>Sec.-ft.</i>
May 15.....	3.51	146	July 28.....	1.80	42
June 16.....	4.11	174	Sept. 15.....	.60	6.9

Daily discharge in second-feet of Crow Creek near Ronan, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	47	34	26	21	22	19.5	57	312	64	13.2	18.2
2.....	47	32	26	22	22	19.5	66	367	59	13.2	3.3
3.....	47	32	22	23	22	18.2	69	301	59	10.8	3.3
4.....	42	32	24	25	22	17	79	270	64	9.5	3.3
5.....	42	32	24	22	22	21	82	250	72	9.5	3.3
6.....	42	32	24	19.5	22	28	79	230	64	9.5	3.3
7.....	37	32	24	22	22	26	74	184	64	9.5	3.3
8.....	34	32	20	22	22	28	69	175	64	9.5	3.3
9.....	32	32	24	19.5	22	26	74	143	57	10.8	3.3
10.....	28	42	22	19.5	19.5	26	79	122	51	12.0	3.3
11.....	26	44	26	19.5	19.5	25	91	129	51	12.0	5.0
12.....	24	42	24	19.5	19.5	25	115	175	51	12.0	5.0
13.....	20	37	24	21	19.5	22	143	211	64	12.0	5.0
14.....	20	37	24	19.5	19.5	25	129	250	62	12.0	5.0
15.....	20	32	24	19.5	19.5	25	129	211	49	12.0	8.2
16.....	20	32	24	19.5	18.2	25	136	184	41	14.5	8.2
17.....	20	32	22	19.5	19.5	28	250	143	37	12.0	9.5
18.....	20	32	22	18.2	19.5	31	250	129	33	8.2	8.2
19.....	20	28	24	18.2	19.5	35	250	143	28	9.5	7.0
20.....	20	28	24	18.2	19.5	39	167	175	38	7.0	7.0
21.....	20	28	24	18.2	19.5	47	175	193	28	5.0	7.0
22.....	20	28	22	18.2	19.5	51	220	103	31	5.0	7.0
23.....	20	28	22	18.2	19.5	55	250	69	30	5.0	7.0
24.....	57	28	22	17	17.0	59	240	59	28	5.0	5.0
25.....	111	28	24	19.5	17.0	66	230	59	28	21	5.0
26.....	125	28	24	21	17.0	69	211	69	28	39	4.2
27.....	94	28	24	19.5	17.0	62	184	64	31	30	3.3
28.....	54	28	20	21	15.8	55	167	59	43	28	3.3
29.....	42	28	20	20	17.0	53	167	69	54	28	5.0
30.....	40	28	20	19	14.5	51	211	74	66	39	9.5
31.....	37	.....	20	18	14.5	.....	260	.....	24	39	.....

NOTE.—Discharge obtained from two fairly well defined rating curves, applicable Oct. 1 to Dec. 31 and Jan. 1 to Sept. 30. Discharge estimated, owing to lack of gage readings, Dec. 28 to Jan. 3 and Jan. 29 to 31. Discharge interpolated, owing to lack of gage reading, July 29.

Monthly discharge of Crow Creek near Ronan, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	125	20	39.6	2,430	B.
November.....	44	28	31.9	1,900	B.
December.....	26	20	23.1	1,420	B.
January.....	25	17	19.9	1,220	C.
February.....	.....	.....	17.0	944	D.
March.....	22	14.5	19.3	1,190	B.
April.....	69	17	35.9	2,140	B.
May.....	260	57	152	9,350	B.
June.....	367	59	164	9,760	B.
July.....	72	24	46.9	2,880	B.
August.....	39	5	14.9	916	B.
September.....	18.2	3.3	5.74	342	C.
The year.....	367	3.3	47.6	34,500	

NOTE.—Discharge for February estimated. Diversions for irrigation were made above the station as follows: May, 3,590 acre-feet; June, 738 acre-feet; July, 1,860 acre-feet; August, 2,010 acre-feet; September, 1,300 acre-feet; October, 2,860 acre-feet.

CROW CREEK AT LOZEAU'S RANCH, NEAR RONAN, MONT.

LOCATION.—In the E. $\frac{1}{2}$ sec. 15, T. 20 N., R. 21 W., at Louis Lozeau's ranch, about 1 mile below the mouth of Mud Creek, about $2\frac{1}{2}$ miles from the junction of Crow Creek with Flathead River, and about 8 miles southwest of Ronan.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 21, 1911, to September 30, 1914.

GAGE.—Vertical staff attached to cottonwood tree on right bank, 75 feet above bridge at Lozeau's ranch.

DISCHARGE MEASUREMENTS.—Made from bridge at high stages and by wading at medium and low stages.

CHANNEL AND CONTROL.—Bed of stream is composed of gravel and cobblestones at the control below the bridge and of gravel and sand at the gage; likely to change at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.5 feet at 9.30 a. m. June 6 (discharge, 355 second-feet); minimum stage recorded, 1.3 feet at 8.30 a. m. August 13, 15, 18, 20, 23, 25, 28, 30, September 3 and 5 (discharge, 35 second-feet).

1911-1914: Maximum stage recorded, 3.4 feet June 29, 1911 (discharge, 960 second-feet); minimum stage recorded, 0.8 foot March 21, 1913 (discharge, 4 second-feet).

WINTER FLOW.—Discharge relation probably affected by ice.

DIVERSIONS.—Water diverted from Mud and Crow creeks above the station.

ACCURACY.—Results fair except during periods of high water.

Discharge measurements of Crow Creek at Lozeau's ranch, near Ronan, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>
May 14.....	1.82	108
June 16.....	2.01	211
July 28.....	1.61	63

Daily discharge, in second-feet, of Crow Creek at Lozeau's ranch, near Ronan, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	55	63	55	53	53	164	53	80	164	127	65	65
2.....	55	65	55	53	53	149	53	80	196	127	59	53
3.....	55	65	55	43	43	99	43	65	213	101	43	35
4.....	55	65	55	53	53	84	53	84	296	125	53	43
5.....	55	65	55	43	.....	65	43	72	304	99	43	35
6.....	55	65	55	53	.....	80	59	99	355	122	51	43
7.....	55	65	55	53	.....	80	53	99	318	120	51	43
8.....	55	65	55	43	.....	65	59	80	239	78	41	43
9.....	55	65	55	53	.....	99	68	99	210	95	51	53
10.....	55	72	55	43	.....	53	53	80	149	77	41	43
11.....	55	78	55	53	.....	65	65	99	170	95	53	53
12.....	55	78	55	53	.....	63	65	99	189	93	43	53
13.....	55	72	55	43	.....	48	59	84	170	93	35	43
14.....	55	65	55	53	.....	59	80	110	235	113	43	53
15.....	55	65	55	43	.....	48	72	122	239	91	35	43
16.....	55	65	55	53	.....	59	99	179	243	110	43	48
17.....	55	65	55	53	.....	59	99	179	243	110	48	48
18.....	55	65	55	43	.....	48	80	149	203	71	35	39
19.....	55	65	55	53	.....	59	80	164	239	71	43	48
20.....	55	65	55	43	.....	48	59	127	203	57	35	39
21.....	55	65	55	53	.....	59	65	149	235	70	43	48
22.....	55	65	55	53	.....	53	72	149	235	68	43	51
23.....	60	60	55	43	.....	43	65	127	193	55	35	41
24.....	60	60	55	53	.....	53	90	179	110	61	43	51
25.....	115	60	55	43	43	43	65	149	110	49	35	41
26.....	95	60	55	53	59	53	90	164	176	59	80	51
27.....	95	55	55	53	65	53	95	149	176	59	53	99
28.....	95	55	55	43	80	43	80	122	130	53	35	80
29.....	78	55	55	53	.....	53	99	136	158	68	43	99
30.....	72	55	55	43	.....	43	68	104	115	55	35	80
31.....	65	.....	55	53	.....	53	.....	149	.....	68	43	.....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 31, from a fairly well defined rating curve; Jan. 1 to June 3, and July 26 to Sept. 30, from a poorly defined rating curve based on discharge measurement May 14 and the lower end of curve for 1913; June 4 to July 25, by indirect method for shifting channels. Discharge estimated, owing to lack of gage readings, Feb. 5 to 24 at 40 second-feet.

Monthly discharge of Crow Creek at Lozeau's ranch, near Ronan, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	115	55	62.7	3,860	B.
November.....	78	55	64.3	3,830	B.
December.....	55	55	55	3,380	C.
January.....	53	49	49.1	3,020	C.
February.....	80	.....	44.6	2,480	D.
March.....	164	43	65.9	4,050	C.
April.....	99	43	69.5	4,140	C.
May.....	179	65	120	7,380	C.
June.....	355	110	207	12,300	C.
July.....	127	49	85.2	5,240	C.
August.....	80	35	45.1	2,770	C.
September.....	99	35	52.1	3,100	C.
The year.....	355	.....	76.8	55,600	

NOTE.—The following diversions were made above station at Lozeau's ranch and below station on Crow Creek near Ronan: August, 197 acre-feet; September, 490 acre-feet. Total diversions above the station as follows: May, 4,710 acre-feet; June, 1,120 acre-feet; July, 2,030 acre-feet; August, 2,230 acre-feet; September, 1,890 acre-feet.

MISSION CREEK NEAR ST. IGNATIUS, MONT.

LOCATION.—In the SW. $\frac{1}{4}$ sec. 10, T. 18 N., R. 20 W., at the house of A. A. Booke, about a mile downstream from St. Ignatius.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 21, 1906, to September 30, 1914.

GAGE.—Original gage was destroyed July 5, 1907. A new gage was installed July 24, 1907, a short distance downstream and with a datum 0.30 foot lower. On January 25, 1908, this gage was lowered 0.39 foot. On June 7, 1908, the gage was again destroyed, and June 26, 1908, was reinstalled 20 feet downstream and at a different datum. A chain gage was installed January 29, 1912, about 200 feet upstream and at a different datum. On May 19, 1913, the chain gage was replaced by a staff at the same datum.

DISCHARGE MEASUREMENTS.—Made by wading or from a bridge 2 miles above gage.

CHANNEL AND CONTROL.—Shifts at high water; current swift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.5 feet at 11 a. m. June 19 and at 5 p. m. June 20 (discharge, 358 second-feet); minimum discharge estimated at 10 second-feet December 26–31.

1906–1914: Maximum discharge estimated at 2,000 second-feet June 7–25, 1908 (gage washed out); minimum stage recorded, 0.2 foot January 30 to February 4, 17–25, March 9–12, 1908; February 28, 1911 (discharge, 8 second-feet). See also Gage.

WINTER FLOW.—Discharge relation little affected by ice.

DIVERSIONS.—Total diversions above the gage amount to about 25 second-feet.

ACCURACY.—Results good.

Discharge measurements of Mission Creek near St. Ignatius, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.
Dec. 12.....	<i>Feet.</i> 1.70	<i>Sec.-ft.</i> 16.9
May 14.....	2.26	66

Daily discharge, in second-feet, of Mission Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	38	29	22	11	16	14	11	26	177	201	61	38
2.....	38	29	22	13	16	14	11	26	226	201	54	38
3.....	38	29	21	15	16	14	11	26	239	226	48	38
4.....	36	29	21	16	14	14	11	26	252	226	46	38
5.....	34	29	20	16	14	14	11	28	226	226	43	38
6.....	31	29	20	16	14	14	12	29	210	213	38	38
7.....	29	29	19	16	14	14	12	29	194	201	43	38
8.....	29	29	19	16	14	14	13	38	177	189	36	38
9.....	29	29	19	16	14	14	13	44	177	177	29	38
10.....	29	29	19	16	14	11	14	49	177	166	29	38
11.....	29	29	19	16	13	11	14	54	162	154	30	38
12.....	29	29	16	16	13	11	15	59	147	147	31	38
13.....	29	29	16	16	12	11	16	64	132	140	31	37
14.....	29	29	16	16	12	11	16	68	154	132	32	37
15.....	29	28	16	16	11	11	16	79	178	132	33	36
16.....	29	27	16	16	11	11	16	90	201	132	33	36
17.....	29	26	16	16	11	11	16	120	252	125	34	35
18.....	29	24	15	16	11	11	16	117	304	118	35	35
19.....	29	22	14	16	11	11	16	132	358	111	35	34
20.....	29	22	14	16	11	11	16	177	358	111	36	34
21.....	29	22	14	16	11	11	16	172	256	111	37	34
22.....	29	22	14	16	11	11	16	166	154	111	37	32
23.....	29	22	14	16	11	11	18	166	154	92	38	29
24.....	29	22	14	16	11	11	19	201	154	84	38	26
25.....	29	22	14	16	11	11	19	173	154	80	38	21
26.....	29	22	10	16	12	11	19	146	226	76	38	16
27.....	29	22	10	16	13	11	19	119	226	76	38	18
28.....	29	22	10	16	14	11	19	92	226	76	38	19
29.....	29	22	10	16	.....	11	19	92	226	73	38	27
30.....	29	22	10	16	.....	11	22	111	201	70	38	35
31.....	29	.....	10	16	.....	11	.....	132	.....	68	38	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimates based on an average of 12 gage readings a month except May, June, and July, during which months an average of 18 readings were taken. Discharge interpolated for days and periods intervening between gage readings, except Dec. 26 to Jan. 3 for which it was estimated from climatic records.

Monthly discharge of Mission Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	38	29	30.3	1,860	B.
November.....	29	22	25.8	1,540	B.
December.....	22	10	15.8	972	B.
January.....	16	11	15.7	965	B.
February.....	16	11	12.7	705	C.
March.....	14	11	11.9	732	C.
April.....	22	11	15.4	916	B.
May.....	201	26	91.4	5,620	B.
June.....	358	132	209	12,400	B.
July.....	226	68	137	8,420	B.
August.....	61	29	37.8	2,320	C.
September.....	38	16	33.2	1,980	B.
The year.....	358	10	53.2	39,400	

NOTE.—Accuracy reduced slightly on account of infrequent gage readings. Diversions above the station as follows: June, 541 acre-feet; July, 1,710 acre-feet; August, 1,070 acre-feet; September, 127 acre-feet.

DRY CREEK NEAR ST. IGNATIUS, MONT.

LOCATION.—At Felsman's ranch, about $1\frac{1}{2}$ miles below St. Marys Lake, above the only tributary, and about 5 miles southeast of St. Ignatius.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 16, 1908, to September 30, 1914.

GAGE.—Staff nailed to tree on left bank.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Coarse gravel and boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.4 feet at 12 m. May 24 (discharge, 202 second-feet); minimum stage recorded, zero on gage April 1-11 (discharge, zero).

1908-1914: Maximum stage recorded, water over gage June 6 and 7, 1908 (discharge estimated at 250 second-feet); minimum stage recorded, zero on gage, November 30, 1908, May 15, 18-21, October 24, November 1-4, 11-15, 17, and 20-30, 1909; April 23, 1910; May 3-7, 1913; April 1-11, 1914 (discharge, zero).

WINTER FLOW.—No flow at gage during winter and early spring.

DIVERSIONS.—One small ditch diverts above the station.

ACCURACY.—Results fair.

No discharge measurements made during year.

Daily discharge, in second-feet, of Dry Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1.....		4	39	48	14	7	16.....	3.0	31	57	39	8.5	4
2.....		4	48	48	14	7	17.....	4.0	39	150	39	7	4
3.....		7	57	39	14	7	18.....	7.0	39	150	48	7	4
4.....		7	67	48	14	7	19.....	2.0	39	125	39	7	4
5.....		7	78	39	14		20.....	3.0	44	78	31	7	4
6.....		10	78	48	14	7	21.....	4.0	39	89	31	7	4
7.....		10	67	57	14	7	22.....	3.0	39	78	25	7	4
8.....		10	67	57	14	7	23.....	4.0	67	78	25	7	4
9.....		10	39	48	10	7	24.....	4.0	202	67	25	7	4
10.....		10	31	48	10	5.5	25.....	5.5	89	67	25	7	4
11.....		14	31	39	10	5.5	26.....	4.0	57	67	19	7	3
12.....	0.2	14	25	57	10	5.5	27.....	4.0	39	78	19	7	3
13.....	.5	19	25	101	10	5.5	28.....	10.0	39	67	19	7	3
14.....	1.2	25	31	78	10	4	29.....	5.5	31	57	14	7	3
15.....	2.0	31	31	48	8.5	4	30.....	4.0	31	57	14	7	3
							31.....		39		14	7	

NOTE.—Daily discharge determined from a well-defined rating curve. No flow Oct. 1 to Apr. 4. Discharge Apr. 5 to Apr. 11 estimated at 0.1 second-foot. Discharge estimated, owing to lack of gage readings, Sept. 27-30.

Monthly discharge of Dry Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
April.....	10	0	2.39	142	C. B. B. C.
May.....	202	4	33.7	2,070	
June.....	150	25	66.0	3,930	
July.....	101	14	39.6	2,430	
August.....	14	7	9.48	583	
September.....	7	3	4.93	293	
The year.....	202	0	13.1	9,450	

NOTE.—No flow Oct. 1 to Apr. 4.

POST CREEK NEAR ST. IGNATIUS, MONT.

LOCATION.—At the highway bridge on section line between secs. 23 and 24, T. 19 N., R. 20 W., about 1 mile below North Fork of Post Creek, and about 5 miles north of St. Ignatius.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 19, 1911, to September 30, 1914, at present site; September 21, 1906, to May 9, 1911, at Fitzpatrick's ranch, 3 miles above present site; at Deschamp's ranch, $1\frac{1}{2}$ miles above present site, April 20 to November 11, 1911.

GAGE.—Chain on the downstream side of the highway bridge.

DISCHARGE MEASUREMENTS.—High-water measurements made from the bridge; low-water measurements are made by wading.

CHANNEL AND CONTROL.—The bed of the stream is composed of gravel and small boulders, free from vegetation and slightly shifting; water swift at gage. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.4 feet at 8 a. m. June 4 (discharge, 431 second-feet); minimum stage recorded, 2.0 feet at 8 a. m. and 5 p. m. September 3 (discharge, 20 second-feet).

1906-1914: Maximum stage recorded, 8.48 feet about June 10, 1908 (gage washed out; discharge estimated at 2,200 second-feet); minimum stage recorded, 2.0 feet September 3, 1914 (discharge, 20 second-feet). (See Records Available.)

WINTER FLOW.—Discharge relation affected by ice to some extent.

DIVERSIONS.—Water is diverted by the Pablo feeder canal built by the Reclamation Service.

ACCURACY.—Results good.

Discharge measurements of Post Creek near St. Ignatius, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
Dec. 12.....	2.35	44	July 28.....	3.08	119
May 14.....	2.39	46	Sept. 15.....	2.09	24

Daily discharge, in second-feet, of Post Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	31	56	46	40	40	62	25	50	236	202	57	25
2.....	31	56	46	40	40	62	32	64	350	225	57	22
3.....	31	49	46	40	36	62	28	44	377	225	57	20
4.....	31	49	46	42	32	52	32	36	431	248	55	22
5.....	31	56	46	59	32	48	28	28	377	236	48	22
6.....	31	56	46	50	32	42	32	32	286	248	42	25
7.....	32	56	46	48	32	42	32	32	225	248	40	25
8.....	31	49	43	48	32	44	28	28	170	225	34	32
9.....	31	49	43	48	32	44	32	32	160	248	32	31
10.....	31	52	43	44	32	44	28	44	134	225	40	22
11.....	31	56	43	40	32	44	48	64	125	225	28	25
12.....	31	56	43	40	32	44	40	55	125	248	28	25
13.....	31	52	43	40	32	44	28	48	170	225	28	22
14.....	31	49	43	40	36	44	32	52	202	225	25	25
15.....	39	48	43	40	40	44	28	69	225	214	22	22
16.....	49	46	46	40	40	44	32	100	236	180	22	25
17.....	49	46	43	40	40	44	32	142	273	160	24	25
18.....	49	46	43	40	40	40	28	134	311	160	25	22
19.....	49	46	43	40	40	49	32	180	350	151	28	25
20.....	49	46	43	40	40	40	28	170	311	151	28	22
21.....	49	46	43	40	40	40	32	214	298	160	28	25
22.....	49	46	43	46	40	40	32	202	260	142	28	25
23.....	49	46	43	42	44	40	28	236	180	134	28	22
24.....	49	46	43	40	52	40	32	298	151	134	25	25
25.....	49	46	43	42	66	40	40	311	170	134	22	22
26.....	49	46	43	57	62	25	44	273	214	125	25	28
27.....	49	46	43	48	110	25	44	214	236	125	24	28
28.....	49	46	43	42	57	25	36	180	248	125	25	27
29.....	49	46	43	40	-----	25	44	180	248	104	25	40
30.....	49	46	43	40	-----	25	36	170	236	69	22	44
31.....	49	-----	43	40	-----	25	-----	180	-----	62	25	-----

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Dec. 31 and Jan. 1 to Sept. 30.

Monthly discharge of Post Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	49	31	40.6	2,500	B.
November.....	56	46	49.3	2,930	B.
December.....	46	43	43.8	2,690	B.
January.....	59	40	43.1	2,650	B.
February.....	110	32	42.2	2,340	B.
March.....	62	25	41.3	2,540	B.
April.....	48	25	32.8	1,950	B.
May.....	311	28	125	7,690	A.
June.....	431	125	244	14,500	A.
July.....	248	62	180	11,100	A.
August.....	57	22	32.2	1,980	A.
September.....	44	20	25.7	1,530	A.
The year.....	431	20	75.1	54,400	

NOTE.—Diversions above station as follows: March, 177 acre-feet; April, 1,180 acre-feet; May, 1,680 acre-feet; July, 137 acre-feet; August, 2,590 acre-feet; September, 2,490 acre-feet.

SOUTH FORK OF JOCKO RIVER NEAR JOCKO, MONT.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 35, T. 17 N., R. 18 W., about 300 feet below junction with Middle Fork of Jocko River and 10 miles northeast of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 11, 1912, to September 30, 1914.

GAGE.—Staff on right bank.

DISCHARGE MEASUREMENTS.—Made from a foot log about 200 feet below gage or by wading.

CHANNEL AND CONTROL.—Boulders and cobblestones; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.5 feet at 9.15 a. m. May 23 (discharge, 405 second-feet); minimum stage recorded, 2 feet at 9.40 a. m. April 2 and 9 (discharge, 34 second-feet).

1912-1914: Maximum stage recorded, 4.15 feet May 31, 1913 (discharge 782 second-feet); minimum stage recorded, 1.93 feet December 7, 1912 (discharge, 28 second-feet). Open-season records only.

WINTER FLOW.—Discharge relation affected by ice. No records obtained.

DIVERSIONS.—No diversion or regulation.

ACCURACY.—Accuracy rating reduced because of lack of daily gage readings.

Discharge measurements of South Fork of Jocko River near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	3.10	243	July 29.....	2.35	82
June 15.....	3.12	268	Sept. 17.....	2.20	59

Daily discharge, in second-feet, of South Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	66	39	34	120	349	166	70	46
2.....	70	39	34	124	343	164	68	45
3.....	74	38	34	127	337	162	67	44
4.....	78	37	34	131	331	161	66	44
5.....	76	36	34	136	325	160	65	44
6.....	74	35	34	141	320	156	64	44
7.....	72	34	34	146	325	153	63	43
8.....	70	34	34	151	331	150	62	42
9.....	68	34	34	156	337	147	61	42
10.....	66	33	34	160	343	144	60	41
11.....	64	32	35	190	349	141	59	40
12.....	62	32	36	220	355	137	59	40
13.....	60	31	37	250	360	133	58	43
14.....	58	30	38	294	305	129	57	46
15.....	56	30	39	338	250	125	56	49
16.....	54	.....	39	382	243	120	55	52
17.....	52	.....	52	386	236	116	54	55
18.....	50	.....	65	389	230	112	53	52
19.....	49	.....	77	392	223	108	53	50
20.....	48	.....	89	395	216	104	52	51
21.....	47	.....	101	398	210	100	51	52
22.....	47	.....	114	401	204	96	50	53
23.....	46	.....	127	405	198	92	50	54
24.....	45	.....	126	399	191	88	50	56
25.....	44	.....	125	393	185	84	49	57
26.....	43	.....	123	386	179	80	48	58
27.....	42	.....	121	379	173	79	47	56
28.....	41	.....	119	372	172	77	47	55
29.....	41	.....	118	366	170	76	47	54
30.....	41	.....	117	360	168	74	47	53
31.....	40	.....	.....	355	.....	72	47	.....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 15 from a poorly defined rating curve, and Apr. 1 to Sept. 30 from a fairly well-defined rating curve. Gage read on average of 5 times a month and discharge interpolated for intervening periods.

Monthly discharge of South Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	78	40	56.3	3,460	
November 1-15.....	39	30	34.3	1,020	
April.....	127	34	67.9	4,040	C.
May.....	405	120	285	17,500	C.
June.....	360	168	265	15,800	C.
July.....	166	72	120	7,380	C.
August.....	70	47	56.0	3,440	C.
September.....	58	40	48.7	2,900	C.

Accuracy rating omitted for October and November because of doubt as to accuracy of discharge measurement made Sept. 10, 1913, on which rating curve for this period is based. Accuracy for other months reduced on account of infrequent gage readings.

JOCKO RIVER NEAR JOCKO, MONT.

LOCATION.—At highway bridge about $1\frac{1}{4}$ miles north of the Jocko Agency, below Big Knife creek, and above Finley, Agency, and Valley creeks.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 20, 1908, to September 30, 1914.

GAGE.—Staff attached to middle pier of bridge.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Practically permanent at ordinary stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.95 feet at 11.50 a. m. June 2 (discharge, 935 second-feet); minimum stage recorded (due to diversions above), 6.86 feet at 10.45 a. m. July 31 (discharge, 53 second-feet).

1906-1914: Maximum stage recorded, 12.25 feet (obtained from high-water marks) June 6, 1908 (discharge, 6,200 second-feet, estimated from floats); minimum stage recorded, 6.86 feet July 31, 1914 (discharge, 53 second-feet). Open-season records; estimates of mean monthly flow only available for winter months.

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Jocko canal diverts about 2 miles above the station; Big Knife canal diverts from Big Knife Creek, and Indian ditch diverts from East Finley Creek; several other small ditches divert from Jocko River and tributaries below the station.

ACCURACY.—Rating curve well defined; records excellent except for lack of daily gage readings.

The following discharge measurement was made by W. A. Lamb:
September 16, 1914: Gage height, 7.16 feet; discharge, 83 second-feet.

Daily discharge, in second-feet, of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	131	152	104	78	323	849	282	53	87
2.....	130	152	100	90	335	935	266	53	87
3.....	130	152	98	103	375	861	250	54	86
4.....	133	152	95	115	415	787	243	54	86
5.....	136	151	93	128	455	712	236	54	85
6.....	140	149	88	140	470	642	228	74	84
7.....	143	148	83	152	485	571	220	74	83
8.....	141	148	78	165	500	500	198	83	81
9.....	140	148	73	177	515	430	175	92	81
10.....	138	148	69	190	515	430	152	101	81
11.....	137	148	65	203	515	430	147	111	81
12.....	136	147	61	216	515	430	142	111	81
13.....	135	146	.....	228	597	451	137	113	82
14.....	134	145	.....	241	679	472	132	113	82
15.....	133	144	.....	253	760	493	132	111	82
16.....	131	142	.....	267	760	515	132	109	90
17.....	130	140	.....	282	760	495	132	107	87
18.....	129	139	.....	297	760	475	116	104	84
19.....	128	137	.....	312	760	455	100	102	85
20.....	126	136	.....	326	744	430	84	100	86
21.....	125	134	.....	341	728	405	68	98	87
22.....	125	130	.....	355	712	380	66	96	88
23.....	125	125	.....	346	712	355	64	95	93
24.....	125	120	.....	338	712	355	62	94	98
25.....	134	116	.....	330	712	335	60	93	104
26.....	144	116	.....	322	712	335	59	91	101
27.....	153	116	.....	314	670	326	58	89	98
28.....	162	116	.....	306	628	317	57	88	95
29.....	159	112	.....	298	585	308	57	88	93
30.....	155	108	.....	310	675	298	53	88	93
31.....	152	.....	.....	.....	762	.....	53	87	.....

NOTE.—Discharge determined from two well-defined rating curves applicable Oct. 1 to Dec. 12, and Apr. 1 to Sept. 30. Gage read an average of nine times a month and discharge interpolated for intervening periods.

Monthly discharge of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	162	125	137	8,420	B.
November.....	152	108	137	8,150	B.
December 1-12.....	.....	.....	83.9	2,000	B.
April.....	355	78	241	14,300	B.
May.....	762	323	608	37,400	B.
June.....	935	298	493	29,300	B.
July.....	282	53	134	8,240	B.
August.....	113	53	89.7	5,520	B.
September.....	104	81	87.7	5,220	B.

NOTE.—Accuracy rating reduced slightly on account of infrequent gage readings. The following diversions made from Jocko River above gage during 1914: May, 1,450 acre-feet; June, 2,700 acre-feet; July, 4,400 acre-feet; August, 2,240 acre-feet; September, 730 acre-feet.

MIDDLE FORK OF JOCKO RIVER NEAR JOCKO, MONT.

LOCATION.—Near north line of sec. 35, T. 17 N., R. 18 W. Montana meridian, about 300 feet above junction of South Fork of Jocko River, and about 10 miles north-east of Jocko, Mont.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1912, to September 30, 1914.

GAGE.—Staff on right bank.

43855°—wsp 392—16—6

DISCHARGE MEASUREMENTS.—Made from a foot log at gage or by wading.

CHANNEL AND CONTROL.—Gravel and cobblestones; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.24 feet at 9.20 a. m. May 23 (discharge, 71 second-feet); minimum stage recorded, 0.45 foot at 4 p. m. December 13 (discharge, 8 second-feet).

1912-1914: Maximum stage recorded, 1.4 feet June 1, 1912 (discharge, 134 second-feet); minimum stage recorded, 0.45 foot December 13, 1913 (discharge, 8 second-feet). Open-season records only.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSION.—No diversion or regulation.

ACCURACY.—Results only fair because of lack of daily gage readings.

Discharge measurements of Middle Fork of Jocko River near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	1.05	45	July 29.....	.78	30.2
June 15.....	.98	40	Sept. 17.....	.64	19.1

Daily discharge, in second-feet, of Middle Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	21	13	9	13	28	51	35	28	20
2.....	21	13	9	13	29	49	34	28	19
3.....	22	13	9	13	30	48	34	28	19
4.....	22	13	9	13	32	47	34	28	19
5.....	21	12	9	14	33	46	34	27	19
6.....	21	12	9	14	34	45	34	26	18
7.....	20	12	9	14	35	47	34	26	18
8.....	20	12	9	14	36	49	32	26	18
9.....	19	12	9	15	38	51	32	26	18
10.....	19	12	8	15	40	53	32	26	18
11.....	18	12	8	15	40	55	32	26	17
12.....	18	12	8	16	45	57	32	25	17
13.....	18	12	8	16	45	58	32	24	17
14.....	17	12	.....	16	52	49	32	24	18
15.....	17	12	.....	16	59	40	32	24	18
16.....	17	12	.....	17	65	40	28	24	19
17.....	16	11	.....	18	66	40	28	24	19
18.....	16	11	.....	20	67	38	28	24	18
19.....	16	11	.....	21	68	38	28	23	17
20.....	16	11	.....	23	69	38	28	22	18
21.....	16	11	.....	25	70	38	28	22	18
22.....	15	10	.....	27	71	38	28	22	18
23.....	15	10	.....	29	71	38	29	22	18
24.....	15	10	.....	29	69	38	29	22	19
25.....	15	10	.....	29	67	38	29	22	19
26.....	15	10	.....	28	65	38	29	20	19
27.....	14	10	.....	28	63	38	29	20	19
28.....	14	10	.....	27	60	38	30	20	19
29.....	14	10	.....	27	57	37	30	20	19
30.....	13	10	.....	27	55	36	30	20	19
31.....	13	.....	.....	.....	53	.....	29	20	.....

NOTE.—Discharge determined as follows: October 1 to May 10, from a fairly well defined rating curve; May 11 to Sept. 30, by indirect method for shifting channels. Gage read an average 5 times a month and discharge interpolated for intervening periods.

Monthly discharge of Middle Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	22	13	16.9	1,040	C.
November.....	13	10	11.4	678	D.
December 1-13.....	9	8	8.7	224	D.
April.....	29	13	19.7	1,170	C.
May.....	71	28	52.0	3,200	C.
June.....	58	36	43.9	2,610	C.
July.....	35	28	30.8	1,890	C.
August.....	28	20	23.8	1,460	C.
September.....	20	17	18.4	1,090	C.

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

NORTH FORK OF JOCKO RIVER NEAR JOCKO, MONT.

LOCATION.—In the NW. $\frac{1}{4}$ sec. 23, T. 17 N., R. 18 W. Montana meridian, three-fourths of a mile above the junction of Falls Creek, and about 10 miles northeast of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1912, to September 30, 1914.

GAGE.—Staff on left bank.

DISCHARGE MEASUREMENTS.—Made from a foot log about 100 feet above gage.

CHANNEL AND CONTROL.—Boulders and cobblestones; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.05 feet at 10.50 a. m. May 23 (discharge, 383 second-feet); minimum stage recorded, 0.55 foot at 1.20 p. m. December 13 (discharge, 6 second-feet).

1912-1914: Maximum stage recorded, 3.4 feet May 31, 1913 (discharge, 492 second-feet); minimum stage recorded, 0.55 foot December 13, 1913 (discharge, 6 second-feet). Open-season records only.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—No diversion or regulation.

ACCURACY.—Results good.

Discharge measurements of North Fork of Jocko River near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	2.25	177	July 29.....	1.08	21.8
June 15.....	2.27	186	Sept. 17.....	1.15	25

Daily discharge, in second-feet, of North Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	13	12	7	21	87	295	83	19	9.4
2.....	13	12	7	21	90	274	82	18	9.3
3.....	14	12	7	21	92	252	81	18	9.2
4.....	14	12	7	21	94	231	80	18	9.0
5.....	15	11	7	22	97	209	79	18	8.8
6.....	15	11	7	22	99	187	77	17	8.7
7.....	14	11	7	23	102	188	76	17	8.6
8.....	14	11	7	23	105	189	75	17	8.5
9.....	14	11	7	23	108	190	74	17	8.4
10.....	13	11	6	24	110	192	72	16	8.3
11.....	13	11	6	24	132	194	71	15	8.2
12.....	13	10	6	25	154	196	70	15	8.1
13.....	13	10	6	25	177	198	67	14	8.0
14.....	13	10	.....	26	241	190	64	14	12
15.....	13	10	.....	26	305	181	61	13	17
16.....	13	10	.....	27	368	169	57	13	21
17.....	13	9	.....	36	370	157	54	13	26
18.....	13	9	.....	45	372	145	50	13	20
19.....	13	8	.....	54	374	132	47	13	13
20.....	13	8	.....	63	376	119	44	12	13
21.....	13	7	.....	72	378	115	42	12	14
22.....	12	7	.....	82	380	110	40	12	15
23.....	12	7	.....	92	383	106	37	12	15
24.....	12	7	.....	91	377	101	35	11	16
25.....	12	7	.....	90	371	97	32	11	17
26.....	12	7	.....	89	365	92	29	11	17
27.....	12	7	.....	88	358	88	26	10	17
28.....	12	7	.....	87	351	87	24	10	17
29.....	12	7	.....	86	344	86	22	9.6	17
30.....	12	7	.....	84	338	85	21	9.6	17
31.....	12	.....	.....	.....	316	.....	20	9.5	.....

NOTE.—Discharge determined from two well-defined rating curves applicable, Oct. 1 to Dec. 13, and Apr. 1 to Sept. 30, respectively. Gage read an average 5 times a month; discharge interpolated for intervening periods.

Monthly discharge of North Fork of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	15	12	13.0	779	C.
November.....	12	7	9.30	553	D.
December 1-13.....	7	6	6.69	172	D.
April.....	92	21	47.8	2,840	C.
May.....	383	87	252	15,500	C.
June.....	295	85	162	9,640	C.
July.....	83	20	54.6	3,360	C.
August.....	19	9.5	13.8	848	C.
September.....	26	8.0	13.3	785	C.

NOTE.—Accuracy reduced on account of infrequent gage readings.

FALLS CREEK NEAR JOCKO, MONT.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 22, T. 17 N., R. 18 W. Montana meridian, about one-fourth mile above junction with North Fork of Jocko River and 9 miles northeast of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 11, 1912, to September 30, 1914.

GAGE.—Staff on right bank.

DISCHARGE MEASUREMENTS.—Made by wading near the gage.

CHANNEL AND CONTROL.—Gravel and cobblestones; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.26 at 11.25 a. m. May 23 (discharge, 83 second-feet); minimum stage recorded, zero November 29 and December 6, 1913 (discharge, 1 second-foot).

1912-1914: Maximum stage recorded, 1.5 feet May 31 and June 1, 1912 (discharge, 89 second-feet); minimum stage recorded, zero November 29 and December 6, 1913 (discharge, 1 second-foot).

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—No diversion or regulation.

ACCURACY.—Results good except for lack of daily gage heights.

Discharge measurements of Falls Creek near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	0.86	29.7	July 29.....	0.30	5.9
June 15.....	.88	38	Sept. 17.....	.48	11.4

Daily discharge, in second-feet, of Falls Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	3.3	2.8	1.0	2.6	9.9	57	18.0	5.5	2.4
2.....	3.6	2.7	1.0	2.6	10.3	51	18.0	5.4	2.3
3.....	3.9	2.7	1.0	2.6	10.6	46	17.0	5.4	2.3
4.....	4.2	2.7	1.0	2.7	11.4	40	17.0	5.3	2.3
5.....	4.0	2.6	1.0	2.8	12.2	35	17.0	5.2	2.3
6.....	3.9	2.6	1.0	2.9	13.0	29	16.6	5.1	2.3
7.....	3.7	2.6	.....	3.0	13.8	30	16.2	5.0	2.3
8.....	3.6	2.6	.....	3.1	14.6	31	15.8	5.0	2.2
9.....	3.4	2.5	.....	3.1	15.4	32	15.4	4.8	2.2
10.....	3.3	2.5	.....	3.2	16.2	33	15.0	4.6	2.1
11.....	3.1	2.4	.....	3.3	22	34	14.6	4.4	2.1
12.....	3.1	2.4	.....	3.4	27	36	14.1	4.2	2.1
13.....	3.0	2.3	.....	3.5	32	38	13.3	4.1	4.0
14.....	3.0	2.3	.....	3.6	45	38	12.5	4.0	5.9
15.....	3.0	2.2	.....	3.7	60	38	11.7	3.9	7.8
16.....	2.9	2.1	.....	3.8	71	36	10.9	3.8	9.7
17.....	2.9	2.0	.....	4.7	73	34	10.1	3.7	11.5
18.....	2.8	1.9	.....	5.6	75	32	9.3	3.6	7.6
19.....	2.8	1.9	.....	6.5	77	30	8.5	3.5	3.8
20.....	2.8	1.8	.....	7.4	79	28	8.2	3.4	4.1
21.....	2.8	1.7	.....	8.3	81	27	7.9	3.3	4.4
22.....	2.8	1.6	.....	9.2	82	26	7.7	3.1	4.7
23.....	2.8	1.5	.....	10.2	83	25	7.5	3.0	5.0
24.....	2.8	1.4	.....	10.1	81	24	7.2	2.9	5.2
25.....	2.8	1.3	.....	10.0	79	22	6.9	2.8	5.5
26.....	2.8	1.3	.....	9.9	77	21	6.6	2.7	5.8
27.....	2.8	1.2	.....	9.8	75	20	6.3	2.6	5.8
28.....	2.8	1.1	.....	9.7	73	20	6.1	2.5	5.8
29.....	2.8	1.0	.....	9.6	70	20	5.8	2.4	5.8
30.....	2.8	1.0	.....	9.5	68	19	5.7	2.4	5.8
31.....	2.8	.....	.....	.....	63	.....	5.6	2.4	.....

NOTE.—Discharge determined from two well-defined curves applicable Oct. 1 to May 22 and May 23 to Sept 30. Gage read an average 5 times a month; discharge interpolated for intervening periods.

Monthly discharge of Falls Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	1.2	2.8	3.13	192.	C.
November.....	2.8	1.0	2.02	120	C.
December 1-6.....			1.00	11.9	C.
April.....	10.2	2.6	5.68	338	C.
May.....	83	9.9	49.0	3,010	C.
June.....	57	19	31.7	1,890	C.
July.....	18	5.6	11.4	701	C.
August.....	5.5	2.4	3.87	238	C.
September.....	11.5	2.1	4.50	268	C.

NOTE.—Accuracy reduced on account of infringement of infrequent gage readings.

BIG KNIFE CREEK NEAR JOCKO, MONT.

LOCATION.—Just above the head gates of the Big Knife canal, about 2½ miles northeast of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 5, 1910, to September 30, 1914; August 19, 1908, to December 31, 1910, at old station, 1 mile below present site.

GAGE.—Staff on right bank.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.75 feet at 8.05 a. m. June 2 (discharge, 33 second-feet); minimum stage recorded, 1.85 feet at 8 a. m. April 1 (discharge, 4.6 second-feet).

1910-1914: Maximum stage recorded, 3.15 feet June 14, 1912 (discharge, 50 second-feet); minimum stage recorded, 1.83 feet April 17, 1911 (discharge, 4.3 second-feet). Open-season records only.

WINTER FLOW.—Discharge relation only slightly affected by ice.

DIVERSIONS.—No diversions above the station. Big Knife canal diverts just below the station.

ACCURACY.—Results good.

Discharge measurements of Big Knife Creek near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>
June 14.....	2.72	31
July 29.....	2.31	14
Sept. 16.....	2.21	10.8

Daily discharge, in second-feet, of Big Knife Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	10	9.4	7.1	4.6	6.0	29	23	14.1	10.2
2.....	10	9.4	7.0	4.6	6.2	33	21	14.0	10.2
3.....	10	9.4	7.0	4.7	6.9	33	21	13.9	10.0
4.....	10	9.4	6.5	4.8	7.6	31	21	13.8	10.0
5.....	10	9.3	6.3	4.9	8.3	31	21	13.7	9.9
6.....	11	9.2	6.3	5.0	9.0	29	21	13.6	9.8
7.....	12	9.0	6.2	5.1	9.8	26	21	13.5	9.7
8.....	12	8.9	6.2	5.1	10.6	24	21	13.2	9.7
9.....	11	8.8	6.2	5.1	11.0	21	19	12.9	9.7
10.....	10	8.8	6.0	5.2	12.0	21	18.9	12.6	9.5
11.....	10	8.8	5.9	5.3	12.6	21	18.6	12.2	9.5
12.....	10	8.7	5.8	5.4	12.2	21	18.3	11.9	9.9
13.....	10	8.5	.....	5.5	13.7	26	18.0	11.6	10.4
14.....	9.9	8.4	.....	5.6	14.3	31	17.7	11.3	10.8
15.....	9.8	8.3	.....	5.7	14.8	30	17.5	11.3	11.3
16.....	9.7	8.3	.....	5.7	17	30	17.3	11.3	11.0
17.....	9.6	8.1	.....	5.7	19	30	17.0	11.3	11.3
18.....	9.6	8.0	.....	5.8	21	28	16.8	11.3	11.6
19.....	9.5	8.0	.....	5.8	24	28	16.6	11.2	11.7
20.....	9.5	8.0	.....	5.9	24	28	16.4	11.1	11.8
21.....	9.4	8.0	.....	5.9	22	27	16.2	11.0	12.0
22.....	9.4	7.9	.....	5.9	22	26	15.9	10.9	12.2
23.....	9.4	7.8	.....	5.9	22	26	15.6	10.8	11.8
24.....	9.4	7.8	.....	5.9	21	26	15.2	10.7	11.4
25.....	10	7.8	.....	5.8	21	25	15.0	10.7	11.0
26.....	11	7.8	.....	5.8	21	25	14.8	10.7	10.6
27.....	12	7.7	.....	5.7	21	25	14.5	10.5	10.2
28.....	12	7.7	.....	5.7	19	24	14.2	10.5	9.8
29.....	11	7.5	.....	5.7	19.2	23	14.2	10.4	9.5
30.....	10	7.3	.....	5.9	23	23	14.2	10.3	9.5
31.....	9.4	.....	.....	.....	26	.....	14.2	10.2	.....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 12, from a fairly well-defined rating curve, and Apr. 1 to Sept. 30, from a well-defined rating curve. Gage read on average 9 times a month; discharge interpolated for intervening periods.

Monthly discharge of Big Knife Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	12	9.4	10.2	627	C.
November.....	9.4	7.3	8.40	500	C.
December 1-12.....	7.1	5.8	6.38	152	C.
April.....	5.9	4.6	5.46	325	D.
May.....	26	6.0	16.1	990	D.
June.....	33	21	26.7	1,590	B.
July.....	23	14.2	17.6	1,080	B.
August.....	14.1	10.2	11.8	726	B.
September.....	12.2	9.5	10.5	625	B.

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

AGENCY CREEK NEAR JOCKO, MONT.

LOCATION.—Just above the intake of the Matt ditch, about 2 miles east of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 19, 1908, to September 30, 1914.

GAGE.—Staff installed May 13, 1913, about 150 feet upstream from staff used prior to that date; readings April 22 to May 13, 1913, reduced to datum of new gage by means of a curve of relations.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.55 feet at 9 a. m.

May 22 (discharge, 70 second-feet); minimum stage recorded, 1.38 feet at 9.45 a. m.

December 12 (discharge, 2.0 second-feet).

1908-1914: Maximum stage recorded, 2.57 feet June 3, 1909 (discharge, 104 second-feet); minimum stage recorded, 1.38 feet December 12, 1913 (discharge, 2.0 second-feet). Open-season records only. (See also description of gages.)

WINTER FLOW.—Discharge relation only slightly affected by ice.

DIVERSIONS.—No diversions above the gage. The Matt ditch is the largest leaving the stream below the gage.

ACCURACY.—Results good.

Discharge measurements of Agency Creek near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 12.....	2.12	30.7	July 30.....	1.78	10.3
June 14.....	2.40	55	Sept. 16.....	1.61	5.1

Daily discharge, in second-feet, of Agency Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	46	64	22	2.8	9.0	48	28	9.4	5.5
2.....	47	63	22	3.0	7.2	50	27	9.2	5.5
3.....	48	62	22	3.2	13.5	49	26	9.0	5.3
4.....	54	60	22	3.4	17.8	48	25	8.9	5.3
5.....	60	58	22	3.6	22	46	24	8.6	5.3
6.....	66	56	22	3.7	23	42	23	8.3	5.2
7.....	72	55	22	3.8	25	38	22	7.9	5.1
8.....	68	53	21	4.0	27	34	22	7.9	5.0
9.....	64	51	21	4.1	28	29	21	7.9	5.0
10.....	60	49	21	4.2	28	29	21	7.9	4.8
11.....	57	48	20	4.3	29	30	20	7.9	4.8
12.....	54	43	20	4.4	29	30	19.8	7.6	5.1
13.....	52	38	.....	4.5	41	42	19.2	7.4	5.4
14.....	50	33	.....	4.5	53	55	18.6	7.2	5.7
15.....	49	33	.....	4.6	65	50	18.2	7.3	6.0
16.....	48	33	.....	5.2	65	46	17.8	7.5	5.0
17.....	48	33	.....	5.8	65	46	17.3	7.7	5.5
18.....	48	33	.....	6.4	66	42	16.8	7.9	6.0
19.....	48	33	.....	7.0	66	42	16.3	7.7	6.3
20.....	48	32	.....	7.6	66	40	15.8	7.5	6.6
21.....	48	32	.....	8.2	70	39	15.4	7.2	6.9
22.....	49	31	.....	8.9	70	38	14.6	7.0	7.2
23.....	50	30	.....	8.9	64	37	13.8	6.8	7.0
24.....	55	29	.....	8.9	58	37	13.0	6.5	6.8
25.....	60	28	.....	8.8	52	33	12.4	6.2	6.5
26.....	66	26	.....	8.7	46	33	11.8	6.0	6.2
27.....	72	24	.....	8.6	46	32	11.2	5.8	5.9
28.....	70	22	.....	8.6	42	31	10.6	5.5	5.6
29.....	68	22	.....	8.6	42	30	10.2	5.5	5.3
30.....	66	22	.....	8.8	44	29	9.9	5.5	5.3
31.....	65	.....	.....	.....	46	.....	9.6	5.5	.....

NOTE.—Daily discharge determined from two well-defined rating curves applicable Oct. 1 to Dec. 31, and Apr. 1 to Sept. 30, respectively. Gage read on average 8 times a month; discharge interpolated for intervening periods.

Monthly discharge of Agency Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	7.2	4.6	5.66	348	B.
November.....	6.4	2.2	3.99	237	B.
April.....	8.9	2.8	5.90	351	B.
May.....	70	9.0	42.8	2,630	B.
June.....	55	29	39.2	2,330	B.
July.....	28	9.6	17.8	1,090	B.
August.....	9.4	5.5	7.36	1,453	B.
September.....	7.2	4.8	5.70	339	B.

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

FINLEY CREEK NEAR JOCKO, MONT.

LOCATION.—At a bridge about one-eighth mile below junction of East and West forks, 300 feet south of the Northern Pacific Railway, about $3\frac{1}{4}$ miles southeast of Arlee, and 4 miles south of Jocko.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 19, 1908, to September 30, 1914.

GAGE.—Staff nailed to a tree on right bank near bridge.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Shifting during floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.03 feet at 10.40 a. m. June 2 (discharge, 100 second-feet); minimum stage recorded, 1.12 feet at 11.05 a. m. December 12 (discharge, 4.4 second-feet).

1909–1914: Maximum stage recorded, 2.3 feet June 3, 1909 (discharge, 269 second-feet); minimum stage recorded, 1.12 feet December 12, 1913 (discharge 4.4 second-feet).

WINTER FLOW.—Discharge relation probably affected by ice.

DIVERSIONS.—Indian ditch diverts water from East Finley Creek just below the station on that stream.

ACCURACY.—Results only fair because of lack of daily gage readings.

Discharge measurements of Finley Creek near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 12.....	1.85	69	July 30.....	1.28	9.4
June 14.....	1.80	70	Sept. 16.....	1.19	6.7

Daily discharge, in second-feet, of Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.*	July.	Aug.	Sept.
1.....	5.5	8.4	5.6	9.6	28	91	41	9.3	6.2
2.....	6.4	8.4	5.6	10	29	100	39	9.3	6.2
3.....	7.2	8.4	5.6	11	36	100	36	9.3	6.0
4.....	8.4	8.4	5.5	12	43	93	36	9.3	6.0
5.....	9.6	8.1	5.4	13	51	93	34	9.3	6.0
6.....	11	7.8	5.2	14	51	83	32	9.3	6.0
7.....	12	7.6	5.0	15	54	73	32	9.3	6.0
8.....	11	7.6	4.9	16	58	62	32	9.3	6.0
9.....	10	7.5	4.8	16	58	51	28	9.3	6.0
10.....	9.6	7.4	4.7	17	58	56	28	9.3	6.0
11.....	9.5	7.2	4.6	17	74	61	27	9.3	6.0
12.....	9.4	7.0	4.4	18	74	66	26	9.3	6.0
13.....	9.3	6.7	.....	18	74	68	25	8.9	6.0
14.....	9.2	6.4	.....	19	87	70	24	8.9	6.0
15.....	9.0	6.4	.....	19	87	76	22	9.0	6.0
16.....	8.7	6.4	.....	20	87	82	20	9.1	6.2
17.....	8.4	6.4	.....	22	82	77	18	9.2	6.3
18.....	8.2	6.4	.....	23	77	71	18	9.3	6.4
19.....	8.0	6.2	.....	24	77	66	17	9.3	6.4
20.....	7.8	6.0	.....	26	77	63	16	8.9	6.8
21.....	7.6	5.8	.....	27	86	59	15	8.9	7.1
22.....	7.7	5.8	.....	28	86	55	14	8.6	7.1
23.....	7.8	5.7	.....	28	86	52	13	8.3	7.1
24.....	8.0	5.6	.....	28	86	52	12	8.0	6.4
25.....	8.3	5.6	.....	27	87	49	11	7.8	6.4
26.....	8.6	5.6	.....	26	87	49	10	7.8	6.4
27.....	8.9	5.6	.....	25	87	48	10	6.2	6.1
28.....	9.2	5.6	.....	25	66	46	9.3	6.2	5.8
29.....	9.0	5.6	.....	25	66	43	9.3	6.2	5.8
30.....	8.7	5.6	.....	26	74	43	9.3	6.2	5.8
31.....	8.4	.....	.....	.....	82	.....	9.3	6.2	.....

NOTE.—Discharge determined as follows: Oct. 1 to June 1 and July 25 to Sept. 30 from two fairly well defined rating curves; June 2 to July 24 by indirect method for shifting channels. Gage read on average 9 times a month; discharge interpolated for intervening periods.

Monthly discharge of Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	12	5.8	9.04	556	B.
November.....	8.7	6.3	7.34	437	B.
December 1-12.....	6.3	4.5	5.57	133	B.
April.....	28	9.6	20.2	1,200	C.
May.....	87	28	69.5	4,270	C.
June.....	100	43	66.6	3,960	C.
July.....	41	9.3	21.7	1,330	C.
August.....	9.3	6.2	8.54	525	C.
September.....	7.1	5.8	6.22	370	C.

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

EAST FINLEY CREEK NEAR JOCKO, MONT.

LOCATION.—Just above the intake of Indian ditch, 4 miles southwest of Jocko and 6 miles southeast of Arlee.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 18, 1908, to July 31, 1911, and January 31, 1912, to September 30, 1914.

GAGE.—Staff on left bank.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.25 feet at 10 a. m. May 22 and 26 (discharge, 55 second-feet); minimum stage recorded, 1.35 feet at 5.05 p. m. September 11 (discharge, 4.2 second-feet).

1909-1914: Maximum stage recorded, 2.84 feet June 3, 1909 (discharge, 132 second-feet); minimum stage recorded, 1.23 feet April 2, 1912 (discharge, 2.6 second-feet). Open-season records; estimates of mean monthly flow only available for winter months.

WINTER FLOW.—Discharge relation slightly affected by ice.

DIVERSIONS.—Indian ditch diverts below the station and takes practically the entire low-water flow. A Reclamation Service ditch, heading above the station, is capable of taking practically the entire flow.

ACCURACY.—Results good.

Discharge measurements of East Finley Creek near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 12.....	2.02	34	July 30.....	1.50	6.6
June 14.....	2.20	49	Sept. 16.....	1.48	6.4

Daily discharge, in second-feet, of East Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	4.6	9.3	5.5	2.8	10.6	46	25	7.0	4.7
2.....	5.0	8.7	5.5	3.0	11.2	50	21	6.9	4.7
3.....	5.5	8.1	5.4	3.2	14.0	50	21	6.8	4.5
4.....	6.0	7.5	5.2	3.4	16.8	45	21	6.6	4.5
5.....	6.5	7.4	5.1	3.6	19.6	45	20	6.6	4.5
6.....	7.0	7.2	5.1	3.8	23	40	20	6.2	4.4
7.....	7.5	7.1	5.0	4.0	26	35	19.6	6.2	4.4
8.....	7.4	7.1	4.9	4.2	29	29	19.6	6.2	4.4
9.....	7.2	7.0	4.9	4.3	33	23	18.6	6.2	4.4
10.....	7.1	6.9	4.8	4.5	33	23	18.6	6.2	4.2
11.....	6.9	6.9	4.6	4.6	34	25	17.0	6.2	4.2
12.....	6.8	6.7	4.5	4.7	34	25	15.5	6.2	4.4
13.....	6.7	6.5	.....	4.8	34	38	14.0	5.7	4.6
14.....	6.5	6.5	.....	4.9	55	50	12.4	5.7	4.8
15.....	6.5	6.5	.....	5.0	55	50	12.4	5.7	5.0
16.....	6.5	6.5	.....	5.8	54	49	11.6	5.8	6.8
17.....	6.5	6.5	.....	6.5	53	45	11.6	5.9	6.5
18.....	6.5	6.5	.....	7.3	51	41	11.1	5.9	6.2
19.....	6.0	6.4	.....	8.1	50	37	10.7	5.9	6.5
20.....	5.5	6.2	.....	8.8	50	34	10.3	5.7	6.8
21.....	5.5	6.1	.....	9.6	55	31	9.8	5.7	7.1
22.....	5.8	5.9	.....	10.4	55	28	9.8	5.6	7.3
23.....	6.0	5.8	.....	10.3	55	26	8.5	5.4	7.1
24.....	5.9	5.7	.....	10.2	55	26	8.5	5.2	7.0
25.....	8.5	5.5	.....	10.0	55	26	8.2	5.0	6.8
26.....	9.5	5.5	.....	9.9	55	26	7.9	5.0	6.5
27.....	10.0	5.5	.....	9.8	49	26	7.6	4.8	6.2
28.....	11.0	5.5	.....	9.7	43	25	7.3	4.8	5.9
29.....	11.0	5.5	.....	9.5	37	25	7.3	4.8	5.7
30.....	10.0	5.5	.....	10.0	40	25	7.3	4.8	5.7
31.....	8.9	.....	.....	.....	43	.....	7.1	4.7	.....

NOTE.—Daily discharge determined as follows: Oct. 1 to Dec. 12, from a fairly well defined rating curve; Apr. 1 to Sept. 30, from a well-defined rating curve. Gage read an average 9 times a month, discharge interpolated for intervening periods.

Monthly discharge of East Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	11	4.6	7.11	437	B.
November.....	9.3	5.5	6.60	393	B.
December 1-12.....	5.5	4.5	5.04	120	B.
April.....	10.4	2.8	6.56	390	B.
May.....	55	10.6	39.6	2,430	B.
June.....	50	23	34.8	2,070	B.
July.....	25	7.1	13.6	836	B.
August.....	7.0	4.7	5.79	356	B.
September.....	7.3	4.2	5.53	329	B.

NOTE.—Accuracy reduced slightly on account of infrequent gage readings.

INDIAN DITCH NEAR JOCKO, MONT.

LOCATION.—Just below intake, about 50 feet below gage on East Finley Creek, and about 4 miles northwest of Jocko.

RECORDS AVAILABLE.—August 18, 1908, to July 31, 1911; January 31, 1912, to September 30, 1914.

GAGE.—Staff in flume just below intake; new gage installed May 14, 1913, 100 feet below intake.

DISCHARGE MEASUREMENTS.—Made by wading in ditch.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.90 feet at 3.25 p. m. May 15 (discharge, 25 second-feet); minimum stage recorded, 0.90 foot at 2.45 p. m. December 9, and 10 a. m. December 12 (discharge, 2.2 second-feet).

1909-1914: Maximum stage recorded, 1.25 feet (old gage) June 21, 1912 (discharge, 29 second-feet); ditch reported dry May 15-19, 1911.

DIVERSIONS.—From July 31, 1911, to the end of season, water in East Finley Creek was diverted into a new ditch built by the Reclamation Service, which heads above the intake of Indian ditch and also the gage on East Finley Creek.

ACCURACY.—Results good except for lack of daily gage heights.

Indian ditch takes water from East Finley Creek. It is about 4 miles long and irrigates land in the vicinity of Jocko Agency.

Discharge measurements of Indian ditch near Jocko, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.	Date.	Gage height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>		<i>Feet.</i>	<i>Sec.-ft.</i>
May 12.....	1.42	12.9	July 30.....	1.14	5.3
June 14.....	1.60	15.5	Sept. 16.....	1.10	5.5

Daily discharge, in second-feet, of Indian ditch near Jocko, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	3.5	6.9	3.6	2.2	9.3	9.2	11.0	4.8	3.9
2.....	3.6	6.9	3.6	2.5	9.7	10.5	10.6	4.9	3.9
3.....	3.6	6.9	3.5	2.7	10.4	10.5	10.3	5.0	4.2
4.....	4.6	6.9	3.3	3.0	11.2	10.0	10.1	5.0	4.2
5.....	5.5	6.9	3.2	3.2	12	10.0	9.9	5.0	4.2
6.....	6.5	6.9	2.9	3.5	14	9.0	9.7	5.0	4.3
7.....	7.5	6.9	2.7	3.8	16	8.0	9.6	5.0	4.4
8.....	7.2	6.8	2.5	4.1	17	7.0	9.2	5.0	4.4
9.....	6.8	6.7	2.2	4.1	19	5.9	8.9	5.0	4.4
10.....	6.5	6.6	2.2	4.2	19	7.2	8.5	5.1	4.4
11.....	6.4	6.5	2.2	4.3	22	8.5	8.7	5.1	4.4
12.....	6.3	6.3	2.2	4.4	22	9.8	8.8	5.1	5.1
13.....	6.2	6.1	.....	4.5	22	13.0	8.9	5.3	5.8
14.....	6.1	5.9	.....	4.6	25	16.0	9.0	5.3	6.5
15.....	5.9	5.8	.....	4.6	25	16.0	8.8	5.3	7.1
16.....	5.7	5.7	.....	5.3	25	16.0	8.6	5.3	5.5
17.....	5.5	5.6	.....	6.0	24	16.0	8.5	5.3	6.7
18.....	5.5	5.5	.....	6.7	23	14.2	8.0	5.3	7.9
19.....	5.5	5.2	.....	7.4	22	14.2	7.5	5.3	8.0
20.....	5.5	4.9	.....	8.1	22	13.4	7.0	5.1	8.2
21.....	5.5	4.6	.....	8.8	21	12.6	6.4	5.1	8.4
22.....	5.5	4.4	.....	9.5	21	11.7	6.1	5.1	8.5
23.....	5.4	4.2	.....	9.3	18	10.8	5.8	5.1	8.5
24.....	5.3	4.0	.....	9.1	15	10.8	5.5	5.0	8.1
25.....	5.8	3.7	.....	9.0	12	10.6	5.3	5.0	8.1
26.....	6.4	3.7	.....	8.9	8.1	10.6	5.1	4.6	7.9
27.....	7.0	3.6	.....	8.7	7.3	10.8	4.9	4.2	7.7
28.....	7.5	3.6	.....	8.6	6.4	11.0	4.8	3.9	7.5
29.....	7.3	3.6	.....	8.5	5.5	11.1	5.0	3.9	7.3
30.....	7.1	3.6	.....	8.9	6.7	11.3	5.3	3.9	7.3
31.....	6.9	.....	.....	.....	7.9	.....	4.8	3.9	.....

NOTE.—Discharge determined as follows: Oct. 1 to May 12, and Sept. 16 to 30, from a well-defined rating curve; May 13 to June 23 and July 31 to Sept. 15, by indirect method for shifting channels; June 24 to July 30, from a fairly well-defined rating curve. Gage read an average 9 times a month; discharge interpolated for intervening periods.

Monthly discharge of Indian ditch near Jocko, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	7.5	3.5	5.92	364	C.
November.....	6.9	3.6	5.50	327	C.
December 1-12.....	3.6	2.2	2.84	68	C.
April.....	9.5	2.2	5.95	354	C.
May.....	25	5.5	16.1	990	C.
June.....	16	5.9	11.2	686	C.
July.....	11	4.8	7.76	477	B.
August.....	5.3	3.9	4.90	301	C.
September.....	8.5	3.9	6.23	371	C.

NOTE.—No water flowing in ditch Dec. 13, 1913, to about Apr. 1, 1914. Accuracy reduced slightly on account of infrequent gage readings.

REVAIS CREEK NEAR DIXON, MONT.

LOCATION.—In T. 18 N., R. 22 W., near the residence of A. Bishop, about 4 miles southwest of Dixon, Mont.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 30, 1911, to September 30, 1914.

GAGE.—Staff attached to tree on right bank about 100 feet below log highway bridge.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Narrow, with high banks; bed composed of small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.0 feet at 7 a. m. and 7 p. m. May 24 (discharge, 202 second-feet); minimum stage recorded, 1.3 feet (discharge, 6 second-feet. (See table of daily discharge for dates.)

1911-1914: Maximum stage recorded, 3.5 feet May 27, 1913 (discharge, 336 second-feet); minimum stage and discharge recorded in 1914.

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—None of importance.

ACCURACY.—Rating curve well defined; records apparently good.

The following discharge measurement was made by W. A. Lamb:

May 11, 1914: Gage height, 2.58 feet; discharge, 112 second-feet.

Daily discharge, in second-feet, of Revais Creek near Dixon, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	7	9.5	11	6	6	8	8	50	97	29	11	6
2.....	7	9.5	11	6	6	8	8	55	114	29	11	6
3.....	7	9.5	9.5	6	6	8	10	89	177	23	8	6
4.....	7	9.5	9.5	8	6	8	10	97	154	23	8	6
5.....	8	11	11	7	8	11	12	97	133	29	11	8
6.....	7	12	8	7	6	8	11	67	81	23	8	6
7.....	7	12	8	7	6	8	18	67	67	18	8	6
8.....	7	12	8	6	6	8	23	74	55	18	8	6
9.....	7	12	8	6	6	8	23	97	45	18	8	8
10.....	8	16	8	8	8	11	29	114	55	23	11	8
11.....	7	14	7	6	6	6	23	114	36	18	8	8
12.....	8	12	7	6	6	6	29	97	45	18	6	6
13.....	8	12	7	6	6	7	36	97	55	18	6	6
14.....	9.5	12	7	6	6	7	45	114	67	14	6	6
15.....	11	14	8	8	8	10	67	177	81	18	8	8
16.....	8	12	7	6	6	8	67	177	67	14	6	6
17.....	8	14	7	6	6	8	55	177	67	14	6	6
18.....	7	14	7	6	6	11	45	166	67	14	6	6
19.....	7	14	7	6	6	10	50	133	67	14	6	6
20.....	8	14	8	8	8	11	97	154	67	18	8	8
21.....	7	12	7	6	6	8	74	133	55	14	8	6
22.....	7	12	7	6	6	8	67	154	45	14	8	6
23.....	7	12	7	6	6	8	67	166	36	14	8	6
24.....	8	12	7	6	6	8	67	202	36	11	6	6
25.....	11	14	8	8	8	11	81	177	45	14	8	8
26.....	12	12	7	6	6	8	55	133	29	11	6	6
27.....	12	12	7	6	7	8	55	97	29	11	6	6
28.....	9.5	12	7	6	8	8	45	97	29	11	6	6
29.....	9.5	12	7	6	.....	8	45	97	29	11	6	6
30.....	11	12	8	8	.....	11	55	97	36	14	8	8
31.....	9.5	.....	7	6	.....	8	.....	81	.....	11	6	.....

NOTE.—Discharge determined from a rating curve well defined below 130 second-feet.

Monthly discharge of Revais Creek near Dixon, Mont., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	12	7	8.3	510	B.
November.....	16	9.5	12.2	726	B.
December.....	11	7	7.8	480	B.
January.....	8	6	6.5	400	B.
February.....	8	6	6.5	361	B.
March.....	11	6	8.5	523	B.
April.....	97	8	42.6	2,530	A.
May.....	202	50	118	7,260	A.
June.....	177	29	65.5	3,900	A.
July.....	29	11	17.1	1,050	A.
August.....	11	6	7.5	461	B.
September.....	8	6	6.5	387	B.
The year.....	202	6	25.6	18,600	

THOMPSON RIVER NEAR THOMPSON FALLS, MONT.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 7, T. 21 N., R. 28 W., at second highway bridge 1 mile from mouth of Thompson River and 8 miles east of Thompson Falls.

DRAINAGE AREA.—601 square miles.

RECORDS AVAILABLE.—February 12, 1911, to September 30, 1914.

GAGE.—Vertical staff attached to the right-hand downstream side of the center pier.

DISCHARGE MEASUREMENTS.—Made from the highway bridge or by wading at the ford 50 feet above bridge.

CHANNEL AND CONTROL.—Practically permanent; broken by one pier; bed of river composed of gravel and small rock.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.4 feet at 5.30 p. m. May 14 (discharge, 1,170 second-feet); minimum stage recorded, 3.7 feet August 22, 26, 27, and 28 (discharge 115 second-feet).

1911-1914: Maximum stage recorded, 7.8 feet May 29, 1913 (discharge, 3,180 second-feet); minimum stage recorded, 3.7 feet August 22, 26, 27, and 28, 1914 (discharge, 115 second-feet). Open-season records only; flow may have been lower at times in winter months.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—A flume takes water from the river one-half mile above the gage for use in the irrigation of bench lands adjoining Clark Fork between the mouth of Thompson River and Thompson Falls.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Data insufficient for computation of monthly discharge.

Discharge measurements of Thompson River near Thompson Falls, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Dis- charge.
Dec. 10.....	Feet. a 3.9	Sec.-ft. 105
Sept. 19.....	3.82	164

a Discharge relation affected by ice.

Daily discharge, in second-feet, of Thompson River near Thompson Falls, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Mar.	Apr.	May.	June.	Aug.	Sept.
1.....							153
2.....							
3.....							152
4.....							
5.....							
6.....							153
7.....							
8.....							
9.....				942		196	153
10.....						153	
11.....					663		
12.....							
13.....							
14.....				1,170	663		
15.....							
16.....	153				596		
17.....							
18.....	153						
19.....							
20.....						153	
21.....							
22.....						115	
23.....							
24.....							
25.....			1,090			153	
26.....						115	
27.....						115	
28.....		296				115	
29.....						153	
30.....							
31.....						153	

NOTE.—Discharge determined by a well-defined rating curve.

PROSPECT CREEK NEAR THOMPSON FALLS, MONT.

LOCATION.—In the NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 18, T. 21 N., R. 29 W., at first highway bridge over Prospect Creek above mouth of Dry Creek, about a mile from Thompson Falls.

DRAINAGE AREA.—139 square miles.

RECORDS AVAILABLE.—February 12, 1911, to September 30, 1914.

GAGE.—Vertical staff attached to pier of bridge.

DISCHARGE MEASUREMENTS.—Made by wading from bridge.

CHANNEL AND CONTROL.—Large rocks; very rough at low water; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year: 5.7 feet at 10 a. m.

May 3 (discharge, 972 second-feet); minimum stage recorded, 2.0 feet at 10 a. m.

August 26-27 (discharge, 8 second-feet).

1911-1914: Maximum stage recorded, 7.5 feet May 29, 1913 (discharge, 1,860 second-feet); minimum stage recorded, 2.0 feet August 26-27, 1914 (discharge, 8 second-feet). Open-season records only.

WINTER FLOW.—Discharge relation seriously affected by ice.

DIVERSIONS.—Pipe line for a power plant diverts about 40 second-feet around the gage.

ACCURACY.—Results fair.

Discharge measurements of Prospect Creek near Thompson Falls, Mont., during the year ending Sept. 30, 1914.

[Made by W. A. Lamb.]

Date.	Gage height.	Discharge.
Dec. 10.....	<i>Feet.</i> 2.12	<i>Sec.-ft.</i> 18.5
Sept. 19.....	2.10	11.6

Daily discharge, in second-feet, of Prospect Creek near Thompson Falls, Mont., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....								273	71		
2.....	13										12
3.....						178	972				
4.....		16									12
5.....											
6.....										17	
7.....							626				12
8.....							586				
9.....							750				
10.....	42		18					160		17	
11.....						586					12
12.....						667		127			
13.....											
14.....								127			
15.....											
16.....											
17.....					470						
18.....							793			12	
19.....				24		586	667				12
20.....						837	586				
21.....											
22.....	42				331					17	
23.....											
24.....							586				
25.....										12	
26.....										8	
27.....										8	
28.....								83			
29.....					178						
30.....	42										
31.....										12	

NOTE.—Discharge determined from a fairly well defined rating curve.

PRIEST RIVER AT OUTLET OF PRIEST LAKE, AT COOLIN, IDAHO.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 9, T. 59 N., R. 4 W., at southeast end of Priest Lake, at town of Coolin, about 2 miles southeast of outlet.

DRAINAGE AREA.—572 square miles.

RECORDS AVAILABLE.—June 18, 1911, to September 30, 1914; fragmentary.

ELEVATION.—Low-water stage of lake, 2,435 feet above sea level.

GAGE.—June 18, 1911, to April 6, 1912, and July 13, 1912, to January 8, 1913, two vertical staff gages attached to piers of wharf at Coolin. These gages were not accurately referred to bench marks and both were torn out by ice; after April 18, 1913, inclined staff gage about 200 feet east of the wharf and 200 feet north of Northern Hotel, and vertical staff on right bank 500 feet below outlet.

DISCHARGE MEASUREMENTS.—Prior to September 17, 1913, made from a boat at outlet; after that date made from a cable.

CHANNEL AND CONTROL.—One channel at outlet, with rocky bed and high banks, probably permanent.

EXTREMES OF DISCHARGE.—1911-1914: Maximum stage recorded, 14.42 feet at 8 p. m. June 4-6, 1913 (discharge, 5,970 second-feet); minimum stage recorded, 1.54 feet at 6.30 p. m. September 13, 1914 (discharge, 276 second-feet).

WINTER FLOW.—Lake is usually frozen over from January 1 to April 15.

DIVERSIONS.—None.

REGULATION.—Natural, in lake.

ACCURACY.—A rating curve applicable to the gage at the outlet has been developed and transferred to the inclined gage at Coolin by means of a curve of relation between the two gages. Wind on lake causes changes in stage at Coolin without corresponding changes at outlet; as the discrepancy may not be compensating a rating curve based on gage heights for inclined gage at Coolin may be considerably in error.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Priest River at outlet of Priest Lake, at Coolin, Idaho, during the year ending Sept. 30, 1914.

Date.	Made by—	River gage height.	Lake gage height.	Discharge.
		<i>Feet.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 27	Brown and Parker	5.47	6.57	4,770
June 27	do.	5.44	6.57	4,940
June 23	G. L. Parker	4.00	5.10	3,060

Daily discharge, in second-feet, of Priest River, at outlet of Priest Lake, at Coolin, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	458	408	715	512	845	715	943	3,170	4,250	2,700	985	385
2	430	419	715	485	845	700	976	3,280	4,320	2,630	985	362
3	458	430	715	485	845	685	1,010	3,390	4,380	2,530	910	340
4	458	430	715	527	845	680	1,040	3,510	4,510	2,530	845	340
5	430	430	685	568	845	675	1,070	3,570	4,380	2,430	845	320
6	430	512	685	655	780	670	1,110	3,630	4,250	2,430	845	320
7	408	458	655	715	748	665	1,140	3,750	4,120	2,330	780	340
8	385	512	655	780	748	660	1,140	3,750	4,120	2,230	780	309
9	408	485	655	845	715	655	1,280	3,870	3,940	2,140	748	300
10	408	485	625	845	715	650	1,280	3,870	3,750	2,050	715	300
11	430	485	610	845	.....	645	1,440	3,990	3,630	2,050	685	280
12	408	485	595	845	.....	640	1,520	4,120	3,510	1,960	685	300
13	408	485	568	.....	.....	635	1,690	4,120	3,510	1,960	655	280
14	458	458	655	.....	.....	630	1,780	4,250	3,510	1,870	625	300
15	458	458	595	.....	.....	625	1,960	4,380	3,390	1,780	610	320
16	458	485	595	.....	.....	625	2,230	4,510	3,350	1,780	595	340
17	458	512	582	.....	.....	625	2,330	4,640	3,320	1,690	595	362
18	430	568	568	.....	.....	655	2,330	4,900	3,280	1,600	568	362
19	485	568	554	.....	.....	685	2,530	5,030	3,240	1,600	540	408
20	485	568	540	.....	.....	655	2,630	4,900	3,210	1,440	540	430
21	485	595	540	.....	.....	685	2,730	4,900	3,170	1,440	512	430
22	485	595	540	.....	.....	715	2,840	4,900	3,170	1,440	512	458
23	485	625	512	.....	.....	780	2,950	5,030	3,060	1,360	485	485
24	485	685	485	.....	.....	845	2,950	5,030	2,950	1,280	485	485
25	485	685	485	.....	.....	845	3,170	4,900	2,950	1,280	458	485
26	485	655	485	.....	.....	845	3,170	4,900	2,950	1,210	444	485
27	485	655	485	.....	.....	845	3,170	4,770	2,950	1,140	430	485
28	485	685	485	.....	.....	845	3,170	4,640	2,890	1,140	408	485
29	485	715	485	.....	.....	845	3,170	4,640	2,820	1,140	408	458
30	430	715	485	.....	.....	878	3,170	4,510	2,760	1,060	408	458
31	430	.....	496	.....	.....	911	.....	4,380	.....	985	385	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 500 and 5,500 second-feet. Discharge interpolated, owing to lack of gage readings, Nov. 2; Dec. 11, 17-19, and 25; Jan. 4; Mar. 2, and 4-14; Mar. 30 to Apr. 6; Apr. 23; May 5, 11, and 27; June 2, 9, 11, and 16-20; June 28 to July 1; Aug. 15 and 26. Mean discharge estimated, owing to lack of gage readings, as follows: Jan. 13 to Feb. 1, 845 second-feet; Feb. 11-23, 715 second-feet.

Monthly discharge of Priest River at outlet of Priest Lake, at Coolin, Idaho, for the year ending Sept. 30, 1914.

[Drainage area, 572 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	485	385	451	0.788	0.91	27,700	A.
November.....	715	408	542	.948	1.06	32,300	A.
December.....	715	485	586	1.02	1.18	36,000	B.
January.....			779	1.36	1.57	47,900	D.
February.....			743	1.30	1.35	41,300	D.
March.....	911	625	717	1.25	1.44	44,100	C.
April.....	3,170	943	2,060	3.60	4.02	123,000	B.
May.....	5,030	3,170	4,300	7.52	8.67	284,000	A.
June.....	4,510	2,760	3,520	6.15	6.86	209,000	C.
July.....	2,700	985	1,780	3.11	3.58	109,000	B.
August.....	985	385	628	1.10	1.27	38,600	B.
September.....	485	280	380	.664	.74	22,600	B.
The year.....	5,030	280	1,380	2.41	32.65	996,000	

SULLIVAN LAKE NEAR METALINE FALLS, WASH.

LOCATION.—On unsurveyed land, approximately in sec. 31, T. 39 N., R. 44 E., near the Forest Service ranger station at the foot of Sullivan Lake, about 6½ miles east of Metaline Falls.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 16, 1912, to September 30, 1914.

GAGE.—Vertical staff May 16, 1912, to April 21, 1913; float gage after May 8, 1913.

EXTREMES OF STAGE.—Maximum stage recorded during year, 26.55 feet at 8.30 a. m. May 16; minimum stage recorded, 14.40 feet March 15 and March 18–21.

1912–1914: Maximum stage recorded, 26.55 feet at 8.30 a. m. May 16, 1914; minimum stage recorded, 11.20 feet at 10.30 a. m. April 13, 1913.

REGULATION.—Most of the surplus flow of Sullivan Creek is diverted into the lake.

Sufficient water is stored in the lake to afford a continuous flow of about 60 second-feet in the flume of the Inland Portland Cement Co. Zero of gage at elevation of gate sills; crest of log chute 22 feet and crest of spillway 25 feet above gate sills.

COOPERATION.—Gage-height record furnished by Inland Portland Cement Co.

Daily gage height, in feet, of Sullivan Lake, near Metaline Falls, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	19.95	18.50	17.25	15.40	15.45	14.70	14.95	23.50	25.30	25.60	24.70	22.75
2.....	19.90	18.45	17.25	15.35	15.45	14.70	14.95	23.80	25.25	25.50	24.60	22.60
3.....	19.85	18.45	17.25	15.30	15.45	14.65	15.00	24.20	25.30	25.55	24.60	22.10
4.....	19.80	18.45	17.25	15.15	15.40	14.65	15.00	24.60	25.40	25.45	24.55	22.45
5.....	19.75	18.45	17.25	15.10	15.40	14.60	15.10	25.00	25.45	25.45	24.50	22.40
6.....	19.70	18.40	17.25	15.20	15.40	14.55	15.20	25.20	25.45	25.45	24.45	22.25
7.....	19.65	18.35	17.15	15.50	15.40	14.50	15.30	25.40	25.40	25.45	24.40	22.10
8.....	19.60	18.30	17.05	15.50	15.40	14.55	15.00	25.60	25.40	25.35	24.35	22.00
9.....	19.50	18.25	16.90	15.45	15.40	14.50	15.65	25.80	25.40	25.35	24.30	21.95
10.....	19.45	18.25	16.80	15.40	15.40	14.50	15.80	25.40	25.40	25.30	24.30	21.90
11.....	19.40	18.20	16.75	15.45	15.30	14.50	15.95	25.60	25.40	25.20	24.25	21.90
12.....	19.35	18.15	16.70	15.50	15.25	14.50	16.30	25.80	25.35	25.20	24.20	21.85
13.....	19.30	18.10	16.65	15.50	15.20	14.50	16.70	26.10	25.45	25.20	24.20	21.75
14.....	19.25	18.00	16.50	15.65	15.10	14.50	17.20	26.30	25.65	25.20	24.15	21.60
15.....	19.20	17.95	16.40	15.70	15.10	14.40	17.80	26.50	25.70	25.20	24.10	21.55
16.....	19.15	17.85	16.35	15.75	15.05	14.45	18.40	26.55	25.70	25.20	24.00	21.45
17.....	19.15	17.70	16.30	15.75	15.00	14.45	18.80	25.55	25.90	25.20	23.90	21.45
18.....	19.10	17.55	16.20	15.70	14.95	14.40	19.05	25.55	25.95	25.20	23.85	21.45
19.....	19.05	17.40	16.20	15.70	14.90	14.40	19.25	25.50	25.90	25.20	23.80	21.45
20.....	19.00	17.35	16.10	15.70	14.85	14.40	19.40	25.50	25.90	25.15	23.70	21.45
21.....	19.00	17.30	16.00	15.70	14.80	14.40	19.70	25.45	25.90	25.05	23.50	21.50
22.....	19.00	17.25	15.90	15.65	14.90	14.45	20.40	25.50	25.90	25.05	23.40	21.50
23.....	19.00	17.20	15.80	15.70	15.00	14.45	21.00	25.45	25.90	25.00	23.30	21.45
24.....	18.95	17.20	15.75	15.70	15.00	14.50	21.50	25.50	25.80	24.95	23.25	21.45
25.....	18.85	17.20	15.70	15.70	14.85	14.55	21.90	25.45	25.85	24.90	23.20	21.45
26.....	18.80	17.25	15.65	15.65	14.80	14.65	22.30	25.45	25.90	24.85	23.15	21.40
27.....	18.75	17.25	15.60	15.60	14.75	14.70	22.70	25.45	25.90	24.80	23.10	21.45
28.....	18.70	17.30	15.50	15.55	14.75	14.80	22.90	25.40	25.90	24.80	23.00	21.50
29.....	18.65	17.25	15.45	15.50	.....	14.85	23.20	25.35	25.75	24.80	22.95	21.45
30.....	18.60	17.25	15.45	15.50	.....	14.90	23.45	25.30	25.60	24.80	22.90	21.40
31.....	18.55	.....	15.45	15.50	.....	14.95	.....	25.30	.....	24.75	22.85	.....

SULLIVAN CREEK NEAR METALINE FALLS, WASH.

LOCATION.—In sec. 30, T. 39 N., R. 44 E., one-fourth mile below junction of Outlet and Sullivan creeks, one-half mile below Sullivan Lake, 1 mile above the dam of the regulating reservoir of the Inland Portland Cement Co., and about 4 miles east of Metaline Falls.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 16, 1912, to September 30, 1914.

GAGE.—Vertical staff nailed to small tree on right bank.

DISCHARGE MEASUREMENTS.—Made by wading or from small bridges above gage.

CHANNEL AND CONTROL.—Cobblestones and rock; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage during year estimated (gage washed out on previous day), 3.80 feet at 8 a. m. May 16 (discharge, 1,340 second-feet); minimum stage recorded, 1.35 feet December 9–13, March 9–10, 29–31, April 1–4 (discharge, 74 second-feet).

1912–1914: Maximum stage recorded, 4.2 feet at 8 a. m. June 2, 1913 (discharge, 1,650 second-feet); minimum stage recorded, 1.10 feet at 10 a. m. February 1, 1913 (discharge, 53 second-feet).

WINTER FLOW.—Discharge relation affected by ice for short periods.

REGULATION.—Water diverted above station during high water and stored in Sullivan Lake; low-water flow regulated by release of this stored water.

ACCURACY.—Results fair.

COOPERATION.—Gage-height record furnished by the Inland Portland Cement Co.

Discharge measurements of Sullivan Creek near Metaline Falls, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 18	L. W. Jordan.....	1.50	96.5	June 13	C. O. Brown.....	2.58	581
Feb. 26	E. W. Kramer.....	1.38	89.8	June 14	do.....	2.58	573
June 13	Parker and Brown.....	2.57	53.6				

Daily discharge, in second-feet, of Sullivan Creek near Metaline Falls, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	133	94	94	94	106	106	74	395	935	470	106	94
2.....	120	94	83	106	83	106	74	525	935	470	106	94
3.....	120	94	83	106	83	83	74	580	935	420	106	94
4.....	133	94	83	106	83	83	74	608	1,000	370	106	83
5.....	133	94	83	120	74	83	83	608	1,060	370	106	83
6.....	133	94	83	164	60	83	120	580	1,000	370	106	94
7.....	133	83	83	182	60	83	133	635	1,000	348	106	106
8.....	120	94	83	133	60	83	148	635	1,000	302	106	106
9.....	120	94	74	120	60	74	200	695	935	280	106	106
10.....	133	83	74	106	60	74	220	1,000	815	260	106	106
11.....	148	83	74	106	106	83	260	1,060	815	240	106	120
12.....	133	83	74	106	106	83	250	1,130	815	240	106	120
13.....	133	83	74	106	120	83	348	1,060	608	220	94	120
14.....	120	83	120	106	120	83	325	1,060	608	200	94	120
15.....	120	83	120	106	94	106	370	1,200	635	200	94	133
16.....	120	83	106	94	83	106	498	1,340	665	182	94	120
17.....	120	94	94	94	83	120	445	1,200	695	182	106	133
18.....	106	106	83	106	83	120	395	1,130	725	182	106	148
19.....	106	106	83	106	83	120	370	1,130	635	164	120	182
20.....	106	106	83	106	83	120	370	1,060	608	164	120	164
21.....	106	106	94	106	94	120	395	1,060	552	133	120	164
22.....	106	106	94	106	94	94	370	1,060	470	133	133	133
23.....	94	106	106	83	106	94	370	1,060	445	133	106	120
24.....	106	106	106	83	106	83	370	1,060	445	120	120	120
25.....	106	120	106	83	94	83	395	1,060	420	106	106	120
26.....	94	106	106	94	94	83	420	935	498	106	106	106
27.....	106	120	106	106	83	83	395	1,000	525	106	106	106
28.....	94	120	106	94	106	83	370	875	498	106	106	120
29.....	94	106	94	94	.....	74	370	755	498	106	106	120
30.....	94	94	94	94	.....	74	370	695	445	106	106	120
31.....	94	.....	94	106	.....	74	.....	815	.....	106	106	.....

NOTE.—Discharge determined from a fairly well-defined rating curve. Discharge relation affected by ice and discharge estimated, Feb. 6-10. Gage washed out May 16 replaced May 24; gage heights for this period estimated by observer.

Monthly discharge of Sullivan Creek near Metaline Falls, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	148	94	116	7,130	B.
November.....	120	83	97.3	5,790	B.
December.....	120	74	91.6	5,630	C.
January.....	182	82	107	6,580	B.
February.....	120	60	88.1	4,890	C.
March.....	120	74	91.2	5,610	C.
April.....	498	74	290	17,300	B.
May.....	1,340	395	903	55,500	B.
June.....	1,060	420	707	42,100	B.
July.....	470	106	222	13,600	B.
August.....	133	94	107	6,580	B.
September.....	182	83	118	7,020	B.
The year.....	1,340	60	246	178,000	

KETTLE RIVER AT BOYDS, WASH.

LOCATION.—In sec. 9, T. 37 N., R. 37 E. Willamette meridian, opposite Great Northern Railway depot at Boyds, $1\frac{1}{4}$ mile above Sherwood Creek and 4 miles above mouth, in Ferry County.

DRAINAGE AREA.—4,060 square miles, measured on British Columbia Railway Belt map and United States Geological Survey map of State of Washington.

RECORDS AVAILABLE.—September 10, 1913, to September 30, 1914.

GAGE.—Since October 18, 1913, inclined and vertical staff, 0 to 13 feet, on right bank, 800 feet east of Great Northern Railway depot; September 10 to October 17, 1913, a vertical staff gage anchored to upstream side of right abutment of Great Northern Railway bridge, a mile below present site and at different datum.

DISCHARGE MEASUREMENTS.—Made from a cable 600 feet above gage or by wading.

CHANNEL AND CONTROL.—One channel at all stages; banks high and will not overflow; control at low stages formed by gravel and cobblestone riffle about 200 feet below gage; control at medium and high stages formed by section of stream bed extending for some distance below gage. Both controls may shift during floods. Zero flow would occur at gage height of -1.1 foot ± 0.1 , as determined August 22, 1914.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 10.0 feet at 7 a. m. May 17 (discharge, 18,000 second-feet); minimum stage recorded, 0.28 foot at 7 a. m. August 30, 1914 (discharge, 288 second-feet).

WINTER FLOW.—Discharge relation seriously affected by ice; flow estimated from discharge measurements and records of temperature.

DIVERSIONS.—None.

REGULATION.—A small amount of storage is utilized for meeting diurnal fluctuation of load at the power plant at Cascade, British Columbia.

ACCURACY.—Gage readings considered fairly reliable and rating is well defined. Very little diurnal fluctuation. Results excellent except when discharge relation was affected by ice.

Discharge measurements of Kettle River at Boyds, Wash., for the period Sept. 10, 1913, to Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 18	F. B. Storey.....	1.69	1,110	June 6	Parker and Brown.....	7.81	12,100
Nov. 3	.....do.....	1.59	1,020	19	C. O. Brown.....	6.84	9,360
4	.....do.....	1.65	1,070	20	.....do.....	6.44	8,460
Jan. 13	L. W. Jordan.....	1.35	881	Aug. 21	.....do.....	.64	435
14	.....do.....	1.25	830	22	.....do.....	.63	434
Feb. 5	James E. Stewart.....	a. 87	490	Sept. 7	.....do.....	.31	302
June 5	Parker and Brown.....	8.65	13,700				

^a Discharge relation affected by ice.

NOTE.—The following gage readings were made at the Great Northern Railway bridge in connection with discharge measurements made Oct. 18, 1913, to Jan. 14, 1914: Oct. 18, 4.03 feet; Nov. 3, 3.97 feet; Nov. 4, 3.99 feet; Jan. 13, 3.70 feet; Jan. 14, 3.55 feet.

Daily discharge, in second-feet, of Kettle River at Boyds, Wash., for the period Sept. 10, 1913, to Sept. 30, 1914.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.		785	970	865	935	520	665	1,560	8,080	8,540	4,760	795	295
2.		785	1,040	830	865	520	695	1,560	9,750	10,500	4,420	795	295
3.		785	1,040	795	865	520	665	1,560	12,400	11,800	4,090	760	295
4.		785	1,040	760	900	520	665	1,560	14,300	16,800	3,930	728	295
5.		785	1,040	665	935	490	665	1,650	13,200	15,100	3,770	728	295
6.		785	1,040	665	935	490	665	1,950	11,300	11,300	3,470	665	295
7.		785	1,040	635	935	490	635	2,780	10,200	9,500	3,190	665	295
8.		785	1,040	605	865	520	635	3,930	9,500	8,080	2,910	605	295
9.		785	1,040	605	795	548	635	4,760	9,500	7,420	2,650	520	295
10.	1,060	785	1,040	605	830	575	635	5,290	10,500	7,000	2,400	495	295
11.	1,060	785	970	605	900	605	635	5,650	11,800	7,000	2,280	495	295
12.	995	785	935	575	935	665	617	6,210	11,500	7,210	2,400	520	315
13.	995	785	900	548	865	695	617	6,800	11,800	7,420	1,560	520	315
14.	930	785	965	605	795	728	617	7,860	12,400	8,780	2,060	520	335
15.	930	785	830	605	865	795	665	9,260	14,300	9,750	2,060	520	375
16.	880	785	830	635	865	795	665	10,800	16,500	10,200	1,950	495	375
17.	845	785	865	635	900	728	695	13,200	18,000	10,200	1,850	495	420
18.	815	1,120	865	635	935	695	760	11,500	15,700	10,500	1,750	470	420
19.	785	1,040	865	728	865	665	830	10,000	14,000	9,500	1,650	470	420
20.	785	1,040	865	728	865	605	935	9,750	13,200	8,310	1,560	470	495
21.	785	1,040	865	665	830	665	1,040	11,000	12,100	7,210	1,370	445	548
22.	785	1,040	865	665	795	865	1,200	10,200	12,400	6,600	1,370	445	695
23.	785	1,040	830	605	728	865	1,370	9,500	12,400	5,830	1,200	420	830
24.	785	1,200	830	605	695	665	1,560	9,020	13,200	5,290	1,200	398	695
25.	785	1,040	865	548	635	665	1,750	9,500	13,700	5,290	1,120	375	635
26.	785	1,120	865	654	635	665	1,750	9,500	13,200	5,470	1,040	375	635
27.	785	1,200	865	760	605	695	1,750	9,020	11,500	5,470	1,040	375	635
28.	785	1,370	865	865	548	665	1,560	8,780	10,200	5,110	970	375	635
29.	785	1,560	865	900	575	-----	1,560	8,310	9,020	4,930	795	355	760
30.	785	1,370	865	935	548	-----	1,560	7,860	8,080	4,760	865	288	970
31.	-----	1,040	-----	935	548	-----	1,560	-----	7,860	-----	865	395	-----

NOTE.—Discharge determined as follows: Sept. 10 to Oct. 17, 1913, from a rating curve fairly well defined between 700 and 1,200 second-feet; Oct. 18, 1913, to Sept. 30, 1914, from a rating curve well defined below 15,000 second-feet; discharge interpolated Oct. 13 and Dec. 26-27; discharge estimated because of ice from observer's notes, climatic records, and one discharge measurement, Jan. 26 to Feb. 14.

Monthly discharge of Kettle River at Boyds, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.	1,560	785	954	58,700	A.
November.	1,040	830	923	54,900	A.
December.	935	548	692	42,500	B.
January.	935	548	800	49,200	B.
February.	865	490	640	35,500	B.
March.	1,750	617	976	60,000	A.
April.	13,200	1,560	7,010	417,000	A.
May.	18,000	7,860	12,000	738,000	A.
June.	16,800	4,760	8,360	497,000	A.
July.	4,760	795	2,150	132,000	A.
August.	795	288	512	31,500	A.
September.	970	295	458	27,300	A.
The year.	18,000	288	2,960	2,140,000	

HALL CREEK NEAR INCHELIUM, WASH.

LOCATION.—In sec. 2, T. 32 N., R. 36 E., at Wires bridge, one-fourth mile from Gwen mine, 3 miles above mouth, and $3\frac{1}{2}$ miles west of Inchelium, after May 15, 1913; prior to that date, in sec. 6, T. 32 N., R. 37 E., about half a mile above mouth.

DRAINAGE AREA.—160 square miles at present site; 163 square miles at original site.

RECORDS AVAILABLE.—December 18, 1912, to September 30, 1914.

GAGES.—Vertical staff on left abutment of bridge; original, or lower, gage was a vertical staff on right bank, one-fourth mile above a wagon bridge.

DISCHARGE MEASUREMENTS.—Made from a bridge or by wading.

CHANNEL AND CONTROL.—Shifting at extreme stages only at present site; shifting at original location.

WINTER FLOW.—Discharge relation affected by ice for short periods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and also for period December 18, 1912, to September 30, 1914, 3.1 feet at 6.20 a. m. April 16 (discharge, 965 second-feet); minimum stage recorded, 0.05 foot at 6.45 p. m. September 5, and 8 a. m. and 7.30 p. m. September 6 (discharge, 18 second-feet).

DIVERSIONS AND REGULATIONS.—None.

ACCURACY.—Results good except for winter season.

Discharge measurements of Hall Creek near Inchelium, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 31	F. B. Storey.....	0.24	33.1	Mar. 23	W. E. Holt ^b	1.29	216
Jan. 25	L. W. Jordan.....	.50	45.8	Apr. 23	.....do.....	2.08	520
Feb. 7	James E. Stewart.....	a 2.45	33.1	May 2	.....do.....	1.70	463
13	W. E. Holt ^b.....	.43	46.2	Aug. 25	C. O. Brown.....	.08	20.0
26	.....do.....	.56	61.0	25	.....do.....	.08	20.0
Mar. 21	.....do.....	1.25	205				

^a Discharge relation affected by ice.

^b Engineer, United States Office of Indian Affairs.

Daily discharge, in second-feet, of Hall Creek near Inchelium, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	24	34	53	56	36	74	157	346	143	62	27	20
2.....	27	34	50	62	34	76	152	365	145	64	27	20
3.....	24	32	49	66	34	72	152	425	135	57	27	21
4.....	25	33	46	71	32	72	189	445	131	62	27	21
5.....	27	34	45	78	33	71	236	425	145	65	27	19
6.....	28	36	43	116	35	69	327	385	135	64	27	18
7.....	28	36	40	152	33	72	445	365	143	55	27	22
8.....	29	34	40	186	28	76	525	346	147	51	25	25
9.....	27	36	38	174	25	80	525	327	122	51	24	24
10.....	28	38	36	147	36	86	567	327	114	46	24	24
11.....	30	40	38	133	40	86	567	308	114	45	24	25
12.....	32	40	40	129	43	92	610	327	112	45	22	24
13.....	32	43	38	120	46	98	653	308	108	45	22	22
14.....	34	43	36	112	55	108	653	308	103	50	21	24
15.....	32	45	36	108	55	122	830	308	96	47	21	27
16.....	34	45	36	103	53	135	920	327	92	43	21	33
17.....	34	46	36	98	50	138	785	308	88	43	21	37
18.....	35	47	36	94	50	138	653	290	86	40	22	40
19.....	36	50	34	88	50	186	610	290	80	40	21	40
20.....	37	50	32	80	50	212	653	254	79	36	21	33
21.....	38	53	31	79	50	202	610	254	78	36	21	32
22.....	40	50	29	69	50	219	567	219	80	36	20	29
23.....	37	54	28	62	53	219	525	236	74	34	20	25
24.....	36	59	29	57	54	236	485	219	82	34	20	24
25.....	37	62	32	55	56	219	465	206	91	33	20	27
26.....	38	59	35	55	62	212	445	193	80	32	20	27
27.....	36	57	40	59	64	186	445	199	74	32	20	27
28.....	35	56	44	36	66	183	405	202	74	31	20	28
29.....	34	55	46	40	.....	145	365	174	67	30	20	27
30.....	30	53	50	43	.....	186	346	163	65	29	20	28
31.....	30	.....	53	42	.....	145	.....	145	.....	28	20	.....

NOTE.—Discharge determined from a fairly well-defined rating curve. Discharge estimated, because of ice, from observer's notes, climatic records, and one discharge measurement, Jan. 28 to Feb. 13.

Monthly discharge of Hall Creek near Inchelium, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	40	24	32.1	1,970	A.
November.....	62	32	45.1	2,680	A.
December.....	53	28	39.3	2,420	A.
January.....	186	a 36	89.4	5,500	B.
February.....	66	a 25	45.5	2,530	C.
March.....	236	69	136	8,360	A.
April.....	920	152	496	29,500	B.
May.....	445	145	290	17,800	A.
June.....	147	65	103	6,130	A.
July.....	65	28	44.1	2,710	A.
August.....	27	20	22.5	1,380	B.
September.....	40	18	26.4	1,570	B.
The year.....	920	18	114	82,600	

a Estimated.

STRANGER CREEK AT INCHELIUM, WASH.

LOCATION.—In sec. 5, T. 32 N., R. 37 E. Willamette meridian, below all tributaries, about half a mile above mouth and half a mile south of Inchelium, in Ferry County.

DRAINAGE AREA.—74 square miles (measured on Colville Indian Reservation map, edition of 1913).

RECORDS AVAILABLE.—March 18, 1914, to September 30, 1914.

GAGE.—Vertical staff, 0 to 5 feet, on right bank, read once a day to nearest quarter-tenth of a foot, by Walter Johnson.

DISCHARGE MEASUREMENTS.—Made from wagon bridge 50 feet below gage, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and gravel; overhanging brush partially obstructs flow at high stages. One channel at all stages. Sand and gravel riffle control 15 feet below gage shifts readily. Zero flow would occur at gage height of about 0.4 foot, as determined August 26, 1914.

EXTREMES OF DISCHARGE.—Minimum stage recorded during period, 3.80 feet April 18-19 (discharge, 209 second-feet); minimum stage recorded. 0.78 foot August 30 to September 6 and September 12 and 13 (discharge, 4.6 second-feet).

WINTER FLOW.—No information.

DIVERSIONS.—Several small ditches divert water for irrigation above gage.

REGULATION.—None.

ACCURACY.—Gage-height record apparently reliable, rating curve fairly well defined. Some diurnal fluctuation March to June. Results fair.

Discharge measurements of Stranger Creek at Inchelium, Wash., for the period of Jan. 25 to Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 25	L. W. Jordan.....		12.50	June 23	.....	1.38	28.9
Feb. 26	W. E. Holt.....	0.7	18.0	July 9	.....	1.15	18.5
Mar. 21	do.....	1.25	43.2	Aug. 6	.....	.92	6.99
23	do.....	1.32	47.5	26	C. O. Brown.....	.82	5.10
Apr. 24	Holt and Talbert.....	3.4	179	26	do.....	.82	5.01
May 2	.....	2.9	109	Sept. 5	.....	.80	4.50
June 6	.....	1.7	39.2				

NOTE.—All measurements except those of Jan. 25 and Aug. 26 were made by engineers of the United States Office of Indian Affairs.

Daily discharge, in second-feet, of Stranger Creek at Inchelium, Wash., from Mar. 18 to Sept. 30, 1914.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....		80	122	47	22	10.3	4.6
2.....		80	112	42	21	10.3	4.6
3.....		80	106	39	21	9.3	4.6
4.....		80	106	39	19	8.3	4.6
5.....		80	106	37	19	8.3	4.6
6.....		86	100	34	22	8.3	4.6
7.....		99	93	42	22	7.7	5.0
8.....		99	93	42	18	7.7	5.5
9.....		112	93	42	16	7.7	5.5
10.....		118	87	37	16	7.7	5.0
11.....		125	87	37	15	7.2	5.0
12.....		132	87	37	15	7.2	4.6
13.....		138	87	37	15	7.2	4.6
14.....		152	81	37	16	7.2	5.0
15.....		180	81	37	15	7.2	6.4
16.....		187	81	34	14	7.2	7.2
17.....		202	81	33	13	7.2	7.2
18.....	31	209	78	32	12	7.2	7.7
19.....	35	209	78	30	12	7.2	8.3
20.....	42	202	72	28	12	6.4	7.7
21.....	42	194	70	28	12	6.4	7.2
22.....	45	194	64	28	12	6.4	7.2
23.....	45	187	75	27	12	5.5	6.4
24.....	50	180	72	27	12	5.5	6.4
25.....	62	180	70	27	12	5.5	6.4
26.....	68	170	64	25	12	5.5	6.4
27.....	74	160	64	23	11	5.5	6.4
28.....	76	151	58	23	11	5.0	6.4
29.....	76	141	53	23	11	5.0	6.4
30.....	76	131	50	22	11	4.6	7.2
31.....	80		47		11	4.6	

NOTE.—Discharge determined as follows: Mar. 18 to Apr. 25 from a rating curve well defined between 15 and 200 second-feet; May 2 to Sept. 30 from a rating curve fairly well defined between 4 and 120 second-feet. Owing to shifting channel, discharge interpolated Apr. 26 to May 1.

Monthly discharge of Stranger Creek at Inchelium, Wash., for the period of Mar. 18 to Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
March 18-31.....	80	31	57.3	1,590	A.
April.....	209	80	145	8,630	A.
May.....	122	47	81.2	4,990	B.
June.....	47	22	33.2	1,980	B.
July.....	22	11	14.9	916	B.
August.....	10.3	4.6	6.98	429	B.
September.....	8.3	4.6	5.96	355	B.
The period.....				18,900	

NORTH FORK OF COEUR D'ALENE RIVER AT PRICHARD, IDAHO.

LOCATION.—In sec. 20, T. 50 N., R. 4 E., at the Prichard ranger station, three-eighths mile above Prichard Creek and one-half mile above Prichard.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 23, 1911, to September 30, 1914.

GAGE.—Vertical staff in 3 sections on right bank.

DISCHARGE MEASUREMENTS.—Made from a cable at the gage or by wading.

CHANNEL AND CONTROL.—Fine gravel; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.5 feet April 16 (discharge, 6,530 second-feet); minimum stage recorded, 0.80 foot September 5-10 (discharge, 126 second-feet).

1911-1914: Maximum stage recorded, 6.1 feet May 10-11, 1913 (discharge, 7,610 second-feet); minimum stage recorded, 0.80 foot September 5-10, 1914 (discharge 126 second-feet).

WINTER FLOW.—Discharge relation affected by ice.

DIVERSION AND REGULATION.—None.

ACCURACY.—Results good.

COOPERATION.—Gage-height record and some discharge measurements furnished by United States Forest Service.

Discharge measurements of North Fork of Coeur d'Alene at Prichard, Idaho, during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 7	L. W. Jordan.....	2.80	1,830	Jan. 9	L. W. Jordan.....	2.53	1,460
8	.....do.....	2.66	1,710	Mar. 6	E. D. Gardner.....	1.90	750

Daily discharge, in second-feet, of North Fork of Coeur d'Alene River at Prichard, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	158	163	576	217	414	830	1,120	2,030	730	254	164	131
2.....	152	172	553	221	414	940	1,180	2,820	730	254	164	128
3.....	149	178	530	213	328	885	1,240	3,500	730	250	164	128
4.....	149	196	508	210	328	885	1,590	3,330	730	278	164	128
5.....	155	278	486	354	292	780	2,500	2,820	639	296	161	126
6.....	158	384	464	1,590	254	730	4,010	2,180	639	296	161	126
7.....	158	481	442	2,180	268	730	4,190	1,240	556	288	161	126
8.....	163	414	420	1,590	301	830	4,370	1,870	556	280	161	126
9.....	178	384	398	1,590	384	1,060	4,010	2,500	518	272	155	126
10.....	196	354	376	1,240	384	1,180	3,840	2,500	481	263	152	126
11.....	233	354	354	1,060	354	1,310	3,840	2,180	481	254	149	128
12.....	246	354	344	885	354	1,380	3,840	2,180	481	259	149	131
13.....	254	327	333	780	328	1,450	3,670	2,180	481	263	147	149
14.....	273	327	322	730	328	2,030	4,190	2,180	464	263	144	164
15.....	254	301	311	684	301	2,820	4,910	2,180	448	259	144	278
16.....	233	301	300	684	287	2,820	5,990	2,180	432	234	142	273
17.....	206	384	289	556	278	2,500	4,550	2,030	416	229	147	414
18.....	192	481	278	598	263	3,160	4,420	1,880	400	221	152	234
19.....	206	639	267	518	278	3,160	4,280	1,730	384	213	164	234
20.....	221	598	256	481	296	2,820	4,140	1,590	384	206	164	225
21.....	195	519	245	448	301	2,500	4,010	1,420	384	199	164	213
22.....	185	481	234	556	448	2,180	3,500	1,240	384	188	164	196
23.....	172	481	223	780	598	2,180	3,500	1,310	384	178	164	178
24.....	175	448	213	684	639	1,880	4,010	1,180	414	175	164	172
25.....	178	481	213	639	730	1,730	3,500	1,060	399	169	158	161
26.....	175	519	213	639	684	1,450	3,160	1,060	384	166	155	144
27.....	172	519	213	518	730	1,240	2,820	1,060	384	166	147	144
28.....	172	556	213	481	730	1,120	2,500	940	354	166	138	142
29.....	169	598	233	414	.....	1,060	2,180	830	354	164	133	110
30.....	169	598	273	481	.....	1,060	1,880	780	354	164	131	140
31.....	166	.....	233	448	.....	1,060	.....	730	.....	164	131	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 150 and 2,000 second-feet. Ice reported Jan. 1, 2, 28-30 and Feb. 2-10, but discharge relation apparently not affected.

Monthly discharge of North Fork of Coeur d'Alene River at Prichard, Idaho, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	273	149	189	11,600	A.
November.....	639	163	409	24,300	B.
December.....	576	213	333	20,500	C.
January.....	2,180	210	725	44,900	B.
February.....	730	254	403	22,400	C.
March.....	3,160	730	1,600	98,400	B.
April.....	5,990	1,120	3,430	204,700	B.
May.....	3,500	730	1,830	113,000	B.
June.....	730	354	482	28,700	B.
July.....	286	164	227	14,000	B.
August.....	164	131	153	9,410	B.
September.....	414	126	171	10,200	B.
The year.....	5,990	126	830	601,000	

COEUR D'ALENE LAKE AT COEUR D'ALENE, IDAHO.

LOCATION.—About 800 feet southeast of the railroad station at Coeur d'Alene.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 11, 1905, to September 30, 1914, April 26, 1903, to February 10, 1905, at gage of the St. Joe Boom Co., at mouth of St. Joe River.

GAGE.—Vertical staff; add 2,100 feet to reduce readings to mean sea level.

EXTREMES OF STAGE.—Maximum stage recorded during year, 29.90 feet at 7 a. m. April 19; minimum stage recorded, 22.22 feet at 7 a. m. December 31 and January 2, 1903–1914: Maximum stage recorded, 34.45 feet May 30–31, 1913; minimum stage recorded, 19.9 feet on October 10–12, 1904, September 24–25, 1905, October 14 to November 3, 1906.

DIVERSIONS.—None.

REGULATION.—Considerable storage is utilized by the Washington Water Power Co. for increasing the summer flow of Spokane River; regulation is effected by tainter gates and a bear-trap dam at Post Falls.

COOPERATION.—Gage-height record furnished by the Washington Water Power Co.

Daily gage height, in feet, of Coeur d'Alene Lake at Coeur d'Alene, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	25.50	23.98	23.06	22.24	26.02	25.30	26.20	29.00	26.74	26.40	26.12	24.78
2.....	25.46	23.80	23.04	22.22	25.98	25.54	26.10	28.80	26.77	26.44	26.10	24.72
3.....	25.42	23.72	22.98	22.28	25.88	25.80	26.34	28.72	26.78	26.47	26.06	24.70
4.....	25.38	23.70	22.90	22.32	25.70	25.95	26.54	28.78	26.74	26.50	26.04	24.66
5.....	25.34	23.66	22.86	22.40	25.46	26.00	26.64	28.86	26.66	26.50	25.96	24.58
6.....	25.32	23.64	22.78	22.70	25.30	26.02	27.06	28.84	26.56	26.54	25.96	24.52
7.....	25.30	23.54	22.72	23.30	25.04	26.00	27.64	28.74	26.46	26.52	25.86	24.50
8.....	25.30	23.40	22.68	23.72	24.84	26.02	28.14	28.60	26.38	26.50	25.80	24.46
9.....	25.30	23.30	22.66	24.10	24.68	26.08	28.50	28.54	26.24	26.52	25.74	24.40
10.....	25.26	23.18	22.62	24.42	24.46	26.22	28.70	28.52	26.12	26.52	25.68	24.36
11.....	25.28	23.14	22.60	24.64	24.38	26.32	28.84	28.56	25.96	26.52	25.68	24.36
12.....	25.30	23.16	22.58	24.80	24.20	26.38	28.96	28.56	25.83	26.50	25.64	24.32
13.....	25.30	23.20	22.56	25.00	24.08	26.42	29.02	28.52	25.70	26.54	25.58	24.28
14.....	25.26	23.10	22.56	25.08	23.90	26.44	29.06	28.46	25.60	26.55	25.54	24.26
15.....	25.22	23.00	22.54	25.24	23.74	26.58	29.22	28.44	25.50	26.53	25.50	24.28
16.....	25.20	22.88	22.52	25.36	23.62	26.88	29.42	28.44	25.53	26.48	25.46	24.26
17.....	25.16	22.76	22.50	25.50	23.46	27.10	29.70	28.46	25.62	26.46	25.40	24.32
18.....	25.12	22.80	22.48	25.56	23.34	27.24	29.87	28.48	25.68	26.46	25.36	24.38
19.....	25.06	22.90	22.46	25.66	23.24	27.44	29.90	28.44	25.75	26.46	25.32	24.46
20.....	25.02	23.00	22.44	25.74	23.16	27.60	29.80	28.34	25.80	26.46	25.28	24.50
21.....	24.96	23.04	22.42	25.80	23.10	27.70	29.74	28.16	25.85	26.42	25.24	24.50
22.....	24.92	23.16	22.32	25.96	21.14	27.70	29.74	28.00	25.90	26.36	25.22	24.50
23.....	24.88	23.10	22.32	26.10	23.36	27.66	29.74	27.90	25.98	26.32	25.16	24.48
24.....	24.84	23.06	22.30	26.14	23.64	27.60	29.74	27.80	26.00	26.30	25.10	24.46
25.....	24.80	23.04	22.28	26.20	24.10	27.52	29.78	27.70	26.08	26.28	25.04	24.44
26.....	24.80	23.02	22.28	26.24	24.54	27.32	29.78	27.58	26.16	26.26	25.00	24.44
27.....	24.76	23.02	22.28	26.22	25.04	27.20	29.70	27.40	26.24	26.24	24.96	24.42
28.....	24.64	23.06	22.28	26.18	25.10	26.96	29.60	27.24	26.28	26.22	24.92	24.40
29.....	24.66	23.08	22.26	26.14	.....	26.76	29.44	27.08	26.34	26.18	24.88	24.38
30.....	24.26	23.10	22.24	26.00	.....	26.54	29.24	26.94	26.38	26.16	24.84	24.36
31.....	24.14	.....	22.22	25.96	.....	26.36	.....	26.80	.....	26.14	24.82	.....

SPOKANE RIVER AT POST FALLS, IDAHO.

LOCATION.—In sec. 4, T. 50 N., R. 5 W., about one-third mile below Washington Water Power Co.'s power plant, three-fourths mile below intake of the Spokane Valley Land and Water Co.'s canal and about a mile below Post Falls.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1913, to September 30, 1914.

GAGE.—Vertical staff in three sections on left bank; add 2,000 feet to reduce readings to mean sea level.

DISCHARGE MEASUREMENTS.—Made from cable about 500 feet below gage.

CHANNELS AND CONTROL.—Gravel and small bowlders; banks high; one channel at all stages; shifts only at extreme stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 74.80 feet at 7.30 a. m. April 19 (discharge, 20,600 second-feet); minimum stage recorded, 66.22 feet at 7.30 a. m. September 8 (discharge, 884 second-feet).

1913-1914: Maximum stage recorded, 77.80 feet at 8 a. m. May 30 and June 1, 1913 (discharge, 31,500 second-feet); minimum stage recorded, 66.22 feet at 7.30 a. m. September 8, 1914 (discharge, 884 second-feet).

WINTER FLOW.—Discharge relation unaffected by ice.

DIVERSIONS.—The Spokane Valley Land and Water Co.'s canal diverts from river about three-fourths mile above gage.

REGULATION.—Flow partly controlled by storage in Coeur d'Alene Lake.

ACCURACY.—Measuring conditions favorable, but gage is read only once a day and results are somewhat impaired by diurnal fluctuation caused by operation of power plant.

COOPERATION.—Gage-height record and some discharge measurements furnished by Washington Water Power Co.

No discharge measurements made during the year.

Daily discharge, in second-feet, of Spokane River at Post Falls, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,380	4,530	4,170	1,560	3,830	6,780	8,760	17,600	6,780	1,560	1,380	1,150
2.....	1,380	5,290	4,170	1,560	3,510	7,010	3,670	16,900	6,780	1,660	1,300	1,150
3.....	1,380	2,120	4,170	1,560	5,290	7,250	2,240	16,900	7,740	1,560	1,470	1,080
4.....	1,560	2,000	4,170	1,660	6,780	7,740	7,250	17,300	7,740	1,470	1,560	1,560
5.....	1,660	2,000	3,510	1,770	6,780	7,490	9,020	17,300	7,740	1,660	1,470	1,560
6.....	1,560	4,170	3,510	1,660	5,900	7,490	9,560	17,300	7,740	2,240	1,470	1,300
7.....	1,560	5,290	2,910	1,660	6,330	7,740	13,500	16,900	7,740	1,660	1,470	920
8.....	1,560	5,090	3,050	1,770	6,110	7,740	13,800	16,600	7,490	1,560	1,470	884
9.....	2,000	4,900	2,000	1,660	6,330	7,740	16,900	16,200	7,490	1,470	1,470	1,470
10.....	2,120	4,710	2,120	1,770	6,110	7,740	17,300	16,200	7,250	1,560	1,560	1,150
11.....	2,120	2,120	2,000	1,660	5,090	8,500	17,600	16,600	7,010	1,560	1,470	1,220
12.....	2,240	1,660	2,120	1,660	5,900	9,020	18,000	16,200	7,010	1,660	1,470	970
13.....	2,240	4,000	2,000	1,770	5,690	9,290	18,000	16,200	6,780	1,560	1,470	1,080
14.....	2,240	5,090	2,120	1,770	5,490	9,290	18,400	16,200	6,780	2,000	1,380	1,080
15.....	2,120	4,530	2,120	1,880	5,290	9,290	18,400	16,200	6,550	1,880	1,380	1,380
16.....	2,120	4,350	1,770	1,770	5,090	9,560	19,100	16,200	2,630	1,560	1,380	1,300
17.....	2,000	4,170	1,770	1,770	4,900	10,700	19,800	16,200	2,240	1,470	1,380	1,150
18.....	2,120	1,770	1,880	1,770	4,900	10,400	20,200	16,200	2,240	1,380	1,380	1,080
19.....	2,240	1,770	1,770	1,880	4,530	10,400	20,600	16,200	2,120	1,470	1,380	1,150
20.....	2,120	1,770	1,770	1,880	4,530	11,900	19,800	15,900	1,880	1,380	1,560	970
21.....	2,120	1,560	1,770	1,770	4,350	12,200	19,800	15,500	1,770	1,470	1,300	1,150
22.....	2,120	3,510	1,770	1,770	4,530	12,500	19,800	14,800	1,560	1,380	1,380	1,300
23.....	2,240	3,830	1,770	3,050	4,710	12,200	19,800	14,800	1,660	1,380	1,300	660
24.....	2,240	3,830	1,770	5,490	5,090	12,900	20,200	14,500	1,560	1,380	1,300	1,080
25.....	2,240	3,830	1,300	5,490	5,490	12,900	20,200	14,200	1,770	1,380	1,300	1,300
26.....	2,240	3,670	1,560	5,490	3,200	13,500	19,800	13,500	1,560	1,220	1,380	1,300
27.....	2,240	3,670	1,380	5,490	6,330	12,900	19,800	13,500	1,470	1,220	1,300	1,020
28.....	4,900	3,670	1,560	5,490	6,550	12,900	19,100	9,290	1,560	1,300	1,380	1,080
29.....	4,710	4,170	1,470	5,490	.....	11,600	19,100	10,700	1,560	1,300	1,220	1,150
30.....	4,710	4,710	1,470	7,490	.....	11,900	18,400	10,400	1,470	1,300	1,150	1,300
31.....	4,530	.....	1,560	2,240	.....	11,600	.....	8,760	.....	1,300	1,080	.....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Spokane River at Post Falls, Idaho, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	4,900	1,380	2,320	143,000	B.
November.....	5,290	1,560	3,590	214,000	B.
December.....	4,170	1,300	2,270	140,000	B.
January.....	7,490	1,560	2,700	166,000	B.
February.....	6,780	3,200	5,310	295,000	B.
March.....	13,500	6,780	10,000	615,000	B.
April.....	20,600	2,240	16,300	970,000	B.
May.....	17,600	8,760	15,200	935,000	B.
June.....	7,740	1,470	4,520	269,000	B.
July.....	2,240	1,220	1,510	92,800	B.
August.....	1,560	1,080	1,390	84,800	B.
September.....	1,660	884	1,200	70,800	B.
The year.....	20,600	884	5,520	4,000,000	

Monthly discharge of Spokane River and Spokane River Land & Water Co. canal at Post Falls, Idaho, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.					Run-off (total in acre-feet).	Accu- racy. .
	River.			Canal (mean).	Total (mean).		
	Maximum.	Minimum.	Mean.				
October.....	4,900	1,380	2,320	60.9	2,380	146,000	B.
November.....	5,290	1,560	3,590	50.0	3,640	217,000	B.
December.....	4,170	1,300	2,270	52.1	2,320	143,000	B.
January.....	7,490	1,560	2,700	57.0	2,760	170,000	B.
February.....	6,780	3,200	5,310	58.1	5,370	298,000	B.
March.....	13,500	6,780	10,000	62.4	10,100	621,000	B.
April.....	20,600	2,240	16,300	72.4	16,400	976,000	B.
May.....	17,600	8,760	15,200	77.0	15,300	941,000	B.
June.....	7,740	1,470	4,520	77.0	4,600	274,000	B.
July.....	2,240	1,220	1,510	77.0	1,590	97,800	B.
August.....	1,560	1,080	1,390	77.0	1,470	90,400	B.
September.....	1,660	884	1,200	77.0	1,280	76,200	B.
The year.....	20,600	884	5,520	66.5	5,590	4,050,000	

SPOKANE RIVER AT SPOKANE, WASH.

LOCATION.—In sec. 9, T. 25 N., R. 43 E., about 500 feet above the Washington Water

Power Co.'s steam plant in city of Spokane, and about 4 miles above Latah Creek.

DRAINAGE AREA.—4,000 square miles.

RECORDS AVAILABLE.—October 25, 1896, to September 30, 1914.

GAGE.—Since July 24, 1911, located about 500 feet above Washington Water Power Co.'s steam-power electric plant; October 16, 1913, inclined and vertical staff was substituted for vertical staff used prior to that date; referred to sea-level datum; all gages installed by Washington Water Power Co. October 25, 1896, to July 8, 1903, the gage was at the Oregon Railroad & Navigation Co.'s bridge; July 9, 1903, to March 30, 1904, at the Olive Avenue Bridge; March 30, 1904, to March 1, 1907, at the Mission Street Bridge; March 1, 1907, to July 23, 1911, at the point where Martha Street approaches the river and about 1,000 feet above the present gages.

DISCHARGE MEASUREMENTS.—Made from a cable 75 feet above the gage. Prior to September 9, 1913, made from a cable at the Martha Street site.

CHANNEL AND CONTROL.—Gravel and boulders; slightly shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 77.6 feet at 8 a. m. April 19 (discharge, 19,600 second-feet); minimum stage recorded, 68.75 feet at 8 a. m. September 27 (discharge, 1,450 second-feet).

1891-1914: Maximum stage recorded, 12.42 feet (Washington Water Power Co.'s gage at dam above Spokane Falls) May 31, 1894 (discharge, 35,200 second-feet); minimum stage recorded, 1.3 feet (Martha Street gage) September 28 and 30, 1905 (discharge, 1,240 second-feet).

Minimum discharge for 1914 differs from that in daily discharge table because gage heights were used to tenths of feet in computing daily discharge.

DIVERSIONS.—Water diverted above station for irrigation by Spokane Valley Land & Water Co.

REGULATION.—Flow partly regulated by storage in Coeur d'Alene Lake.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by the Washington Water Power Co.

Discharge measurements of Spokane River at Spokane, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 28	F. B. Storey.....	71.08	4,330	Aug. 19	Parker and Hoyt.....	69.10	1,880
29	do.....	71.08	4,320	Sept. 28	C. O. Brown.....	68.93	1,660
June 3	Parker and Brown.....	73.10	8,230				

Daily discharge, in second-feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,700	4,210	4,210	2,250	3,920	6,680	10,500	17,200	7,270	2,140	1,810	1,500
2.....	1,810	4,860	4,060	5,200	6,680	9,400	17,000	7,070	2,250	1,810	1,700	1,700
3.....	1,810	2,710	4,060	2,250	5,920	7,070	3,360	17,000	8,090	2,140	1,920	2,250
4.....	1,920	2,590	3,920	2,140	6,490	7,070	17,000	8,090	2,140	1,920	1,920	1,600
5.....	1,920	2,590	3,640	2,140	5,740	7,470	8,960	16,700	7,880	2,250	1,920	1,920
6.....	1,920	4,060	3,640	2,140	6,110	7,470	9,620	16,700	7,880	2,470	1,920	1,500
7.....	1,920	4,860	3,360	2,140	6,110	7,270	12,000	16,400	7,880	2,250	1,920	1,500
8.....	1,920	4,860	3,220	2,140	5,920	7,470	13,800	16,100	7,670	2,140	1,920	2,140
9.....	2,360	4,690	2,590	2,140	5,920	7,470	15,300	15,800	7,470	2,140	1,920	1,810
10.....	2,250	4,530	2,590	2,140	5,920	7,670	16,100	15,800	7,470	2,140	1,920	1,700
11.....	2,250	3,640	2,590	2,140	5,200	8,300	16,700	15,800	7,070	2,140	1,920	1,700
12.....	2,250	2,360	2,590	2,140	5,740	8,740	17,000	15,800	7,070	2,140	1,920	1,810
13.....	2,360	2,360	2,590	2,360	5,560	8,960	17,200	15,600	7,070	2,250	1,920	1,600
14.....	2,360	4,370	2,590	2,360	5,380	9,180	17,200	15,600	6,870	2,360	1,810	1,700
15.....	2,360	4,370	2,590	2,250	5,200	9,180	17,600	15,600	6,680	2,360	1,810	1,600
16.....	2,360	4,210	2,360	2,250	5,200	10,100	18,100	15,600	3,500	2,140	1,810	1,810
17.....	2,360	4,210	2,360	2,360	4,860	10,500	18,700	15,600	3,220	2,030	1,810	1,600
18.....	2,360	2,360	2,360	2,360	4,860	10,800	19,300	15,600	2,960	2,030	1,810	1,600
19.....	2,360	2,360	2,360	2,250	4,530	11,000	19,600	15,600	2,830	2,030	1,810	1,500
20.....	2,360	2,360	2,360	2,250	4,530	12,000	19,300	15,300	2,590	2,030	2,590	1,500
21.....	2,360	2,360	2,360	2,250	4,530	12,500	19,000	14,800	2,590	2,030	1,810	1,600
22.....	2,360	3,500	2,360	2,250	4,530	13,000	19,000	14,500	2,470	1,920	1,810	1,700
23.....	2,360	3,780	2,360	4,860	4,530	13,000	19,000	14,200	2,360	1,920	1,700	1,700
24.....	2,360	3,780	2,360	5,030	4,860	13,000	19,000	14,000	2,140	1,810	1,810	1,600
25.....	2,360	3,780	2,140	5,200	5,200	13,000	19,000	13,800	2,250	1,810	1,810	1,600
26.....	2,360	3,780	2,140	5,200	5,560	13,000	19,300	13,500	2,250	1,810	1,810	1,700
27.....	2,360	3,780	2,250	5,200	5,920	12,500	19,000	13,200	2,250	1,810	1,810	1,500
28.....	4,210	3,780	2,140	5,200	6,300	12,200	18,700	12,800	2,250	1,810	1,810	1,600
29.....	4,310	4,210	2,140	7,070	.....	11,500	18,400	11,000	2,250	1,810	1,600	1,600
30.....	4,210	4,210	2,140	2,590	.....	11,300	17,800	10,800	2,250	1,810	1,700	1,600
31.....	4,210	.....	2,250	3,780	.....	11,000	.....	9,180	.....	1,810	1,700	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	4,370	1,700	2,470	152,000	A.
November.....	4,860	2,360	3,650	218,000	A.
December.....	4,210	2,140	2,730	168,000	A.
January.....	7,070	2,140	3,000	184,000	A.
February.....	6,490	3,920	5,350	297,000	A.
March.....	13,000	6,680	9,910	609,000	A.
April.....	19,600	3,960	15,800	940,000	A.
May.....	17,200	9,180	15,000	922,000	A.
June.....	8,090	2,140	4,990	297,000	A.
July.....	2,470	1,810	2,060	127,000	A.
August.....	2,590	1,600	1,860	114,000	A.
September.....	2,250	1,500	1,670	99,400	A.
The year.....	19,600	1,500	5,700	4,180,000	

SPOKANE RIVER BELOW LITTLE FALLS, NEAR LONG LAKE, WASH.

LOCATION.—In the NW. $\frac{1}{4}$ sec. 19, T. 27 N., R. 39 E., just above Chamokane Ferry, $1\frac{1}{2}$ miles below Little Falls power plant of Washington Water Power Co., 4 miles below Chamokane Creek, and about 5 miles below Long Lake below all tributaries of importance.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 5, 1912, to September 30, 1914.

GAGE.—Inclined and vertical staff on left bank anchored to concrete slabs; readings show elevations above sea level. Stevens water-stage recorder about 90 feet downstream; add 1,200 feet to reduce gage readings to mean sea level.

DISCHARGE MEASUREMENTS.—Made from cable about 50 feet below water-stage recorder.

CHANNEL AND CONTROL.—Heavy boulders; practically permanent; no noticeable riffle control below gage.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 85.23 feet at 2 p. m. April 18 (discharge, 22,500 second-feet); minimum discharge 1,910 second-feet September 7; minimum stage below 75.1 feet (the lowest elevation at which water can enter stilling well) for a part of each day from September 3–13 and 15–30; discharge for such stages estimated by computing flow through the wheels at the Little Falls power plant and adding 250 second-feet for seepage through gates, around dam, and inflow between power plant and gaging station.

1912 to 1914: Maximum stage recorded, 88.68 feet at 11 a. m. and 7 p. m. June 1, 1913 (discharge, 31,900 second-feet); minimum discharge September 7, 1914, 1,910 second-feet.

WINTER FLOW.—Discharge relation not affected by ice.

REGULATION.—Normal flow affected by operation of Little Falls power plant. Flow partly regulated by storage in Coeur d'Alene Lake.

DIVERSION.—Water is diverted above the station for irrigation by the Spokane Valley Land & Water Co.

ACCURACY.—Results excellent.

COOPERATION.—Stationed maintained in cooperation with Washington Water Power Co.

Discharge measurements of Spokane River below Little Falls, near Long Lake, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
Oct. 10	G. L. Parker.....	<i>Feet.</i> 76.20	<i>Sec.-ft.</i> 3,010
15	Parker and Slack.....	76.72	3,580
Aug. 20	Parker and Hoyt.....	75.13	2,070

Daily discharge in second-feet, of Spokane River below Little Falls, near Long Lake, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	2,470	4,780	5,080	2,940	5,970	10,100	13,200	19,700	10,100	3,040	2,470	2,650
2.....	2,740	5,400	4,930	3,040	5,080	10,500	11,700	19,200	8,990	3,040	2,470	2,470
3.....	2,740	4,210	4,930	2,940	5,740	10,500	5,570	18,900	9,210	3,040	2,650	1,990
4.....	2,840	3,580	4,930	2,840	6,610	10,500	5,570	18,700	9,430	2,940	2,840	2,140
5.....	2,650	3,820	4,630	3,350	7,350	10,300	9,430	18,700	9,430	3,040	2,740	2,080
6.....	2,840	3,700	4,490	3,950	6,970	10,100	11,000	18,700	9,430	3,140	2,740	1,990
7.....	2,840	5,740	4,210	3,950	7,150	9,870	14,500	18,400	9,210	3,240	2,650	1,910
8.....	2,840	5,740	4,210	3,820	6,970	9,870	16,800	18,400	9,210	3,140	2,560	2,010
9.....	3,040	5,400	3,820	3,700	6,970	10,100	17,600	18,200	8,990	3,040	2,300	2,060
10.....	3,240	5,570	3,240	3,580	6,970	10,100	18,400	17,900	8,990	2,940	2,740	2,240
11.....	3,240	3,580	3,460	3,350	5,740	10,300	18,700	17,900	8,770	2,940	2,740	2,260
12.....	3,040	3,460	3,460	3,140	6,430	11,000	18,900	17,900	8,550	2,940	2,650	2,540
13.....	3,240	3,580	3,460	3,240	6,610	11,200	19,200	17,900	8,350	2,940	2,740	2,140
14.....	3,040	3,950	3,350	3,140	6,610	11,500	19,400	17,600	8,150	3,140	2,650	2,560
15.....	3,350	5,400	3,460	3,140	6,430	11,700	19,700	17,600	7,950	3,140	2,650	2,480
16.....	3,140	4,930	3,240	3,140	6,430	12,000	20,200	17,600	6,250	3,140	2,840	2,440
17.....	3,140	4,630	3,140	3,140	6,250	12,700	20,500	17,600	4,930	2,940	2,840	2,490
18.....	3,140	3,460	3,140	3,240	6,080	13,000	21,300	17,600	4,630	2,840	2,740	2,550
19.....	3,140	3,240	3,240	3,350	5,910	13,500	21,300	17,600	4,210	2,740	2,000	2,660
20.....	3,240	3,140	3,140	3,350	4,930	14,000	21,300	17,100	3,950	2,740	1,930	2,210
21.....	3,040	3,240	3,040	3,240	6,430	14,500	21,000	16,800	3,700	2,740	2,560	2,320
22.....	3,240	3,460	3,140	3,240	8,770	14,800	21,000	16,300	3,820	2,940	2,380	2,300
23.....	3,140	4,350	2,940	6,610	8,770	15,000	21,000	16,100	3,700	2,650	2,470	2,220
24.....	3,140	4,630	3,040	6,970	8,770	15,300	21,000	15,800	3,240	2,650	2,470	2,380
25.....	3,140	4,630	2,840	7,150	10,100	15,300	21,000	15,800	3,240	2,650	2,560	2,250
26.....	3,140	4,630	2,470	7,150	12,000	15,600	21,000	15,600	3,460	2,560	2,470	2,370
27.....	3,140	4,630	2,590	7,150	9,870	15,000	21,000	15,600	3,460	2,650	2,380	2,020
28.....	4,210	4,630	2,710	6,970	9,870	14,800	20,800	14,800	3,240	2,650	2,560	2,400
29.....	5,080	4,930	2,830	6,700	-----	14,200	20,800	13,500	3,140	2,650	2,650	2,410
30.....	4,930	4,930	2,940	7,750	-----	14,000	20,200	13,000	3,040	2,470	2,380	2,410
31.....	4,780	-----	2,840	6,860	-----	13,500	-----	11,700	-----	2,560	2,650	-----

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 13-25 estimated, owing to lack of gage height record, by comparative hydrographs of records obtained at Post Falls and Spokane. Water surface below intake pipe of automatic gage part of each day from Sept. 3 to 13 and Sept. 15 to 30; discharge for such stages determined from records of a German water meter at the Little Falls plant supplemented by an estimate of waste and leakage.

Monthly discharge of Spokane River below Little Falls, near Long Lake, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	5,080	2,470	3,260	200,000	A.
November.....	5,740	3,140	4,380	261,000	A.
December.....	5,080	2,470	3,510	216,000	A.
January.....	7,750	2,840	4,390	270,000	B.
February.....	12,000	4,930	7,210	400,000	A.
March.....	15,600	9,870	12,400	762,000	A.
April.....	21,300	5,570	17,800	1,060,000	A.
May.....	19,700	11,700	17,000	1,050,000	A.
June.....	10,100	3,040	6,430	383,000	A.
July.....	3,240	2,470	2,880	177,000	A.
August.....	2,840	1,930	2,560	157,000	A.
September.....	2,660	1,910	2,300	137,000	A.
The year.....	21,300	1,910	7,000	5,070,000	

ST. JOE RIVER AT AVERY, IDAHO.

LOCATION.—In sec. 15, T. 45 N., R. 5 E., at Avery, one-half mile below junction of North and South Forks.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1911, to September 30, 1914.

GAGE.—Vertical and inclined staff installed September 18, 1912, on left bank 20 feet above suspension bridge, about 500 feet below Chicago, Milwaukee & Puget Sound depot. Original gage was read January 1 to July 2, 1911, and May 13 to September 16, 1912, on an old bridge pier a short distance below the Mountain View hotel, about 700 feet below present site. Readings July 11, 1911, to May 10, 1912, made on gage in front of post office and about 100 feet below present gage.

DISCHARGE MEASUREMENTS.—Made from the suspension bridge or by wading.

CHANNEL AND CONTROL.—Wide and shallow with steep gradient; bed of gravel and small boulders; shifting during floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.4 feet at 9 a. m. May 15 (discharge, 7,070 second-feet); minimum discharge, 215 second-feet February 6, when discharge relation was seriously affected by ice; determined by one discharge measurement, observer's notes, and temperature record.

1911-1914: Maximum stage recorded, 7.3 feet at 5 a. m. May 28, 1913 (discharge, 17,900 second-feet); minimum flow probably occurs during winter, when discharge relation is seriously affected by ice. Data insufficient for estimating flow during January and February, 1911, or December, 1911, and January, 1912.

WINTER FLOW.—Discharge relation seriously affected by ice.

DIVERSIONS.—Above all important diversions.

ACCURACY.—Results fair.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of St. Joe River at Avery, Idaho, during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 11	L. W. Jordan.....	0.75	554
Mar. 10	E. D. Gardner.....	.95	1,120
June 1	Parker and Brown.....	1.84	2,860

^a Discharge relation probably affected by ice.

Daily discharge, in second-feet, of St. Joe River at Avery, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1.....	284	310	432	420	260	480	930	3,600	2,850	847	360
2.....	286	340	420	480	233	615	1,120	3,600	2,980	782	340
3.....	288	310	310	480	260	494	1,310	6,530	2,850	765	372
4.....	289	310	310	548	260	480	1,500	5,990	2,600	782	340
5.....	290	340	310	548	260	468	2,360	5,720	2,310	798	330
6.....	290	660	360	615	215	480	3,100	5,990	2,020	765	330
7.....	310	615	480	615	260	548	3,100	6,260	1,910	735	330
8.....	310	615	480	615	260	848	3,220	6,530	1,800	690	340
9.....	310	615	420	615	310	966	3,350	6,530	1,700	615	330
10.....	320	690	420	574	360	930	3,600	5,990	1,700	615	320
11.....	384	645	420	548	360	1,020	3,600	5,450	1,650	615	300
12.....	408	602	480	548	360	1,600	3,600	5,450	1,600	615	280
13.....	432	548	507	548	360	1,700	3,850	5,720	1,500	630	270
14.....	408	548	480	548	420	1,300	4,110	6,260	1,500	588	270
15.....	350	480	480	548	420	1,700	5,180	6,530	1,500	588	260
16.....	330	456	456	480	360	1,700	5,720	6,800	1,500	588	260
17.....	310	480	384	480	360	2,360	4,640	6,260	1,500	561	280
18.....	280	548	420	420	420	2,360	3,850	5,990	1,300	507	300
19.....	295	548	420	420	420	2,360	3,850	5,450	1,110	480	280
20.....	310	480	360	360	480	2,360	4,640	4,910	1,070	480	260
21.....	310	456	310	360	420	2,360	4,110	4,910	1,040	480	260
22.....	310	507	310	420	420	1,700	4,910	4,910	1,000	462	260
23.....	300	480	360	360	480	1,910	6,800	5,990	966	444	260
24.....	320	480	420	310	480	1,700	6,530	5,180	984	444	260
25.....	350	480	420	360	480	1,300	6,260	4,370	1,000	420	260
26.....	360	456	420	360	480	1,110	4,370	4,110	930	420	260
27.....	384	360	420	310	444	1,110	4,110	3,350	966	408	251
28.....	360	432	360	310	456	1,110	3,850	3,350	948	384	242
29.....	310	480	310	310	.....	1,110	3,350	3,100	930	360	242
30.....	310	456	310	310	.....	930	3,600	2,850	848	360	242
31.....	310	.....	360	310	.....	930	.....	2,850	.....	360	242

NOTE.—Discharge determined from a rating curve fairly well defined between 260 and 3,350 second-feet. Discharge estimated, because of ice, from observer's notes, climatic records, and one discharge measurement, Dec. 5-12, and Dec. 19 to Feb. 25.

Monthly discharge of St. Joe River at Avery, Idaho, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	432	280	326	20,000	B.
November.....	690	310	491	29,200	B.
December.....	507	310	398	24,500	C.
January.....	615	310	456	28,000	D.
February.....	480	215	368	20,400	D.
March.....	2,360	468	1,290	79,300	B.
April.....	6,800	930	3,820	227,000	B.
May.....	6,800	2,850	5,180	319,000	B.
June.....	2,980	848	1,550	92,200	B.
July.....	847	360	567	34,900	B.
August.....	372	242	288	17,700	B.
The period.....	.....	.....	.....	892,000	

SPOKANE VALLEY LAND & WATER CO.'S CANAL AT POST FALLS, IDAHO.

LOCATION.—At the lower end of the 1,600-foot flume diverting from Spokane River at Post Falls.

RECORDS AVAILABLE.—May 20, 1911, to September 30, 1914,

GAGE.—Vertical staff reading depths in flume.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Wooden flume.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.30 feet April 12 to September 30 (discharge, 77 second-feet); minimum stage recorded, 1.80 feet November 17–20 (discharge, 46 second-feet).

1911–1914: Maximum stage recorded, 3.20 feet June 18–22, 1911 (discharge, 170 second-feet); no water running in canal June 23–28, 1911, and January 7–9, 1912.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by Spokane Valley Land & Water Co.

No discharge measurements made during the year.

Daily discharge, in second-feet, of Spokane Valley Land & Water Co.'s Canal at Post Falls, Idaho, for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	63	51	51	51	58	70	50	77	77	77	77	77
2.....	63	51	51	51	57	70	66	77	77	77	77	77
3.....	63	51	51	51	57	70	66	77	77	77	77	77
4.....	63	51	51	51	57	70	66	77	77	77	77	77
5.....	63	51	51	52	57	70	66	77	77	77	77	77
6.....	63	51	51	52	54	70	66	77	77	77	77	77
7.....	63	51	51	57	54	70	66	77	77	77	77	77
8.....	63	51	54	57	54	70	66	77	77	77	77	77
9.....	63	51	54	57	54	63	66	77	77	77	77	77
10.....	63	48	54	57	62	63	66	77	77	77	77	77
11.....	63	48	54	57	62	63	66	77	77	77	77	77
12.....	63	48	54	57	62	63	77	77	77	77	77	77
13.....	63	48	54	57	62	63	77	77	77	77	77	77
14.....	63	48	54	57	62	63	77	77	77	77	77	77
15.....	63	48	52	58	60	63	77	77	77	77	77	77
16.....	63	48	52	58	60	63	77	77	77	77	77	77
17.....	63	46	52	58	58	63	77	77	77	77	77	77
18.....	63	46	52	60	58	63	77	77	77	77	77	77
19.....	63	46	52	60	58	63	77	77	77	77	77	77
20.....	63	46	52	60	58	63	77	77	77	77	77	77
21.....	63	54	52	60	58	63	77	77	77	77	77	77
22.....	63	54	52	60	58	63	77	77	77	77	77	77
23.....	63	54	52	60	58	60	77	77	77	77	77	77
24.....	63	54	52	60	58	60	77	77	77	77	77	77
25.....	63	51	52	60	58	57	77	77	77	77	77	77
26.....	54	51	52	60	58	54	77	77	77	77	77	77
27.....	54	51	52	58	58	54	77	77	77	77	77	77
28.....	51	51	51	58	58	54	77	77	77	77	77	77
29.....	51	51	51	58	.....	54	77	77	77	77	77	77
30.....	51	51	51	58	.....	50	77	77	77	77	77	77
31.....	51	.....	51	58	.....	50	.....	77	.....	77	.....	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Spokane Valley Land & Water Co.'s Canal at Post Falls, Idaho, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	63	51	60.9	3,740	B.
November.....	54	46	50.0	2,980	B.
December.....	54	51	52.1	3,200	B.
January.....	60	51	57.0	3,500	B.
February.....	62	54	58.1	3,230	B.
March.....	70	50	62.4	3,840	B.
April.....	77	50	72.4	4,310	B.
May.....	77	77	77.0	4,730	B.
June.....	77	77	77.0	4,580	B.
July.....	77	77	77.0	4,730	B.
August.....	77	77	77.0	4,730	B.
September.....	77	77	77.0	4,580	B.
The year.....	77	46	66.5	48,200	

NOTE.—Accuracy reduced because of lack of discharge measurements and the fact that gage was not read to hundredths.

SANPOIL RIVER AT KELLER, WASH.

LOCATION.—In the NW. $\frac{1}{4}$ sec. 9, T. 29 N., R. 33 E., just below a highway bridge at Keller, three-fourths of a mile below Silver Creek, and about 22 miles north of Wilbur.

DRAINAGE AREA.—971 square miles.

RECORDS AVAILABLE.—April 29, 1911, to September 30, 1914.

GAGE.—Vertical staff on right bank 100 feet below bridge.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Rock and gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1911–1914, 4.17 feet at 6.30 a. m. April 17 (discharge, 1,650 second-feet); minimum stage recorded, 0.45 foot at 7 a. m. and 4 p. m. September 1 (discharge, 26 second-feet).

DIVERSIONS.—About 7 acres of land irrigated above station.

ACCURACY.—Results good except during winter.

Discharge measurements of Sanpoil River at Keller, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 21	L. W. Jordan.....	1.48	210
21	.....do.....	1.48	211
Aug. 31	C. O. Brown.....	49	28.5

Daily discharge, in second-feet, of Sanpoil River at Keller, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	47	54	155	71	160	273	609	907	428	170	45	26
2.....	45	52	145	71	135	310	583	879	428	160	42	28
3.....	46	52	140	68	109	331	583	907	428	150	41	28
4.....	45	51	126	82	96	331	609	963	403	140	41	28
5.....	46	64	120	92	85	310	689	963	428	130	40	28
6.....	45	68	111	140	75	288	743	907	428	125	40	28
7.....	47	62	107	289	61	288	851	851	354	120	39	28
8.....	47	59	99	569	56	310	963	824	354	115	38	28
9.....	47	58	98	536	56	331	1,080	797	354	110	36	28
10.....	46	59	99	442	61	378	1,080	770	354	106	35	30
11.....	51	59	97	386	85	403	1,080	770	354	100	35	31
12.....	53	58	95	335	101	428	1,080	743	331	98	34	32
13.....	53	57	94	312	109	454	1,190	743	331	94	34	35
14.....	53	57	85	277	120	505	1,190	716	310	96	34	36
15.....	54	56	83	264	120	583	1,250	716	284	98	34	44
16.....	55	54	85	256	142	662	1,490	689	276	94	34	46
17.....	56	57	83	241	126	662	1,610	662	265	90	34	49
18.....	57	72	78	234	120	689	1,430	662	249	88	34	50
19.....	57	69	78	223	120	716	1,310	635	238	86	34	50
20.....	58	72	75	212	120	716	1,250	635	232	88	32	50
21.....	58	72	71	209	135	743	1,190	557	224	86	32	50
22.....	57	71	72	206	163	770	1,250	531	218	83	32	50
23.....	55	69	74	196	186	770	1,190	531	250	78	32	50
24.....	54	77	76	186	206	743	1,080	531	190	71	32	50
25.....	56	88	78	147	234	770	1,020	505	300	67	32	57
26.....	54	90	77	163	256	770	1,080	505	265	61	32	50
27.....	56	103	74	174	256	716	1,080	479	235	58	32	50
28.....	54	128	75	133	256	689	1,020	479	220	53	32	50
29.....	56	150	71	142	.....	662	963	454	200	52	31	50
30.....	54	166	68	150	.....	635	963	428	180	50	30	50
31.....	56	.....	72	163	.....	635	.....	454	.....	47	28	.....

NOTE.—Discharge determined from rating curves well defined between 20 and 600 second-feet, applicable Oct. 1 to Feb. 28 and Mar. 1 to Sept. 30. Discharge interpolated, owing to lack of gage readings, Oct. 14–17, 19, 20, 22, and 23. Discharge interpolated because of probable effect of ice on discharge relation, Dec. 11, 12, 22–24, and Jan. 29. Discharge estimated, because of ice, from observer's notes and climatic records, Feb. 4–15. Discharge estimated, owing to lack of gage readings, from hydrographic comparison with records of Nespelem River at Nespelem, Wash., June 23 to July 9.

Monthly discharge of Sanpoil River at Keller, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	58	45	52.2	3,210	A.
November.....	166	51	73.5	4,370	A.
December.....	155	68	92.3	5,680	A.
January.....	569	68	225	13,800	A.
February.....	256	56	134	7,440	C.
March.....	770	273	544	33,500	A.
April.....	1,610	583	1,050	62,500	B.
May.....	963	423	684	42,100	B.
June.....	423	180	304	18,100	B.
July.....	170	47	95.6	5,880	B.
August.....	45	28	34.9	2,150	A.
September.....	57	26	40.3	2,400	A.
The year.....	1,610	26	278	201,000	

NESPELEM RIVER AT NESPELEM, WASH.

LOCATION.—In sec. 24, T. 31 N., R. 30 E., at United States Indian Service bridge about half a mile above Nespelem, about 5 miles above Little Nespelem River, and about 6 miles above the mouth.

DRAINAGE AREA.—122 square miles.

RECORDS AVAILABLE.—May 1, 1911, to September 30, 1914.

GAGE.—Vertical staff on left bank opposite two large cottonwood trees and about 500 feet above the second ranch house. Prior to July 30, 1913, station was located about one-quarter mile upstream.

DISCHARGE MEASUREMENTS.—Made from the bridge at the gage, or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; shifting; aquatic growth during summer months.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.75 feet at 9 a. m. April 16 (discharge, 442 second-feet); minimum stage reported, 1.00 foot October 1-5 (discharge, 7.0 second-feet).

1911-1914, maximum stage recorded, 4.75 feet at 9 a. m. April 16, 1914 (discharge, 442 second-feet); minimum stage recorded, 1.00 foot August 6 and 7; August 13 to September 28, 1913, and October 1-5, 1913 (discharge, 7.0 second-feet).

WINTER FLOW.—Discharge relation seldom affected by ice.

DIVERSIONS.—Above all diversions.

ACCURACY.—Results good.

Discharge measurements of Nespelem River at Nespelem, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 26	F. B. Storey.....	1.07	9.6	Apr. 18	Holt and Talbert ^a	4.28	372
Feb. 20	W. E. Holt ^a	1.35	34.5	Aug. 30	C. O. Brown ^a.....	.88	8.7
22	do.....	1.48	42.1	30	do.....	.88	8.6
Apr. 17	Holt and Talbert ^a	4.65	426				

^a Engineers, United States Office of Indian Affairs.

Daily discharge, in second-feet, of Nespelem River at Nespelem, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	7.0	10.2	22.6	10.2	34	64	152	226	108	37	13.5	9.5
2.	7.0	10.2	20.5	10.2	31	69	152	213	88	34	13.5	9.5
3.	7.0	10.2	17.0	11.0	30	69	152	226	88	30	13.5	9.5
4.	7.0	10.2	14.0	12.2	30	69	152	239	88	30	13.5	9.5
5.	7.0	15.8	14.0	15.8	30	69	164	226	98	30	13.5	9.5
6.	7.8	15.8	12.2	20.5	29	69	188	226	98	29	13.5	9.5
7.	7.8	15.8	12.2	28	29	74	200	213	103	27	13.5	9.5
8.	9.0	14.0	11.0	31	27	78	226	213	108	27	12.7	9.5
9.	9.0	14.0	10.2	34	27	78	226	200	98	25	12.7	9.5
10.	10.2	12.2	10.2	34	27	88	265	200	88	24	11.5	9.5
11.	10.2	12.2	10.2	38	27	98	265	213	88	24	11.5	9.5
12.	10.2	12.2	10.2	34	29	103	278	200	88	24	11.5	9.5
13.	10.2	11.0	10.2	36	30	114	278	188	78	23	10.3	9.5
14.	10.2	11.0	10.2	36	30	130	305	176	74	24	10.3	10.3
15.	10.2	11.0	10.2	37	30	141	361	176	69	24	9.5	10.3
16.	10.2	11.0	10.2	38	30	152	449	176	64	24	9.5	11.5
17.	10.2	11.0	10.2	38	30	176	419	176	60	23	9.5	11.5
18.	10.2	17.0	10.2	38	30	176	375	176	56	21	9.5	12.7
19.	10.2	17.0	9.0	37	29	176	347	176	52	19	9.5	13.5
20.	10.2	15.8	9.0	36	31	188	333	176	48	13.5	9.5	13.5
21.	10.2	14.0	9.0	36	31	188	333	164	48	13.5	9.5	12.7
22.	10.2	14.0	9.0	37	41	200	305	164	50	13.5	9.5	12.7
23.	10.2	12.2	9.0	31	43	200	278	152	44	13.5	9.5	11.5
24.	10.2	12.2	9.0	31	44	200	278	141	44	13.5	9.5	11.5
25.	10.2	18.4	9.0	31	48	200	265	141	60	13.5	9.5	10.3
26.	10.2	18.4	9.0	31	50	200	252	130	52	13.5	9.5	10.3
27.	10.2	18.4	9.0	31	52	200	252	130	48	13.5	9.5	10.3
28.	10.2	20.5	9.0	31	60	188	252	130	46	13.5	9.5	9.5
29.	10.2	22.6	9.0	30	-----	176	239	124	44	13.5	9.2	9.5
30.	10.2	24.0	9.0	30	-----	176	226	106	43	13.5	9.2	9.5
31.	10.2	-----	10.2	31	-----	176	-----	88	-----	13.5	9.5	-----

NOTE.—Discharge determined as follows: Oct. 1 to Jan. 9, from a fairly well-defined rating curve; Jan. 10 to Sept. 30, 1914, from a rating curve well defined between 10 and 80 second-feet. Discharge interpolated on account of ice, Feb. 5.

Monthly discharge of Nespelem River at Nespelem, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	10.2	7.0	9.45	581	B.
November.....	24.0	10.2	14.4	857	B.
December.....	22.6	9.0	11.1	682	B.
January.....	38	10.2	29.8	1,830	B.
February.....	60	27	34.2	1,900	B.
March.....	200	64	138	8,480	A.
April.....	449	152	266	15,800	B.
May.....	239	88	177	10,900	B.
June.....	108	43	70.7	4,210	A.
July.....	37	13.5	21.3	1,310	A.
August.....	13.5	9.2	10.8	664	A.
September.....	13.5	9.5	10.5	625	B.
The year.....	449	7.0	66.1	47,800	

OKANOGAN RIVER AT OKANOGAN, WASH.

LOCATION.—In sec. 16, T. 33 N., R. 26 E., at Okanogan, just above Salmon Creek.

DRAINAGE AREA.—7,740 square miles.

RECORDS AVAILABLE.—May 10, 1911, to September 30, 1914.

GAGE.—Vertical staff nailed to steamboat dock on right bank.

DISCHARGE MEASUREMENTS.—Made from highway bridge 2,000 feet below gage.

CHANNEL AND CONTROL.—Gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.76 feet at 5 p. m.

May 17 and at 9.30 a. m. and 3 p. m. May 18 (discharge, 13,600 second-feet); minimum stage recorded, 2.48 feet at 10 a. m. and 3.30 p. m. September 9 (discharge, 1,080 second-feet).

1911-1914: Maximum stage recorded, 11.2 feet at 4 p. m. June 5 and at 10.30 a. m. and 1.30 p. m. June 6 (discharge, 17,600 second-feet); minimum stage recorded, 1.9 feet September 14-15, 1911 (discharge, 720 second-feet). Maximum and minimum for the year 1914 differ from those recorded in daily-discharge table because gage heights to tenths of feet were used in computing discharge.

WINTER FLOW.—Discharge relation not seriously affected by ice.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Okanogan River at Okanogan, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Oct. 7	F. B. Storey	<i>Feet.</i> 2.69	<i>Sec.-ft.</i> 1,320	June 25	C. O. Brown	<i>Feet.</i> 6.62	6,650
9	.....do.....	2.62	1,160	Sept. 11	.....do.....	2.50	1,050
Feb. 12	W. C. Muldrow	2.64	1,190				

Daily discharge, in second-feet, of Okanogan River at Okanogan, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,370	1,790	1,570			1,180	1,370	4,400	8,760	6,060	2,080	1,180
2.....	1,370	1,790	1,470			1,180	1,370	4,550	9,640	6,060	2,050	1,180
3.....	1,270	1,790	1,470			1,180	1,370	5,750	11,100	6,060	2,020	1,180
4.....	1,270	1,680	1,470			1,180	1,370	7,380	12,400	5,890	2,020	1,180
5.....	1,270	1,680	1,370		1,250	1,180	1,370	7,380	11,600	5,650	2,020	1,100
6.....	1,270	1,570	1,370			1,180	1,470	6,860	10,300	5,450	1,900	1,100
7.....	1,270	1,570	1,370			1,180	1,570	6,700	9,200	5,150	1,900	1,100
8.....	1,270	1,570	1,370	1,790		1,180	1,790	6,540	8,550	5,000	1,790	1,100
9.....	1,270	1,570	1,370	1,790		1,180	2,020	6,380	7,940	4,700	1,790	1,100
10.....	1,270	1,570	1,370	1,790		1,180	2,380	6,700	7,750	4,550	1,790	1,100
11.....	1,270	1,570	1,370	1,680		1,100	2,620	7,380	7,380	4,250	1,790	1,100
12.....	1,470	1,570	1,270	1,570		1,100	3,010	7,940	7,380	4,250	1,680	1,100
13.....	1,790	1,570	1,270	1,570	1,180	1,100	3,270	8,340	7,750	4,100	1,680	1,100
14.....	2,020	1,470	1,270	1,470	1,180	1,180	3,540	9,200	8,760	4,100	1,680	1,100
15.....	2,020	1,470	1,270	1,470	1,180	1,180	3,820	10,600	9,420	4,100	1,570	1,100
16.....	1,900	1,470	1,270	1,570	1,180	1,180	4,250	12,900	9,870	4,100	1,570	1,100
17.....	1,790	1,470	1,270	1,570	1,180	1,180	4,550	13,400	10,600	3,820	1,570	1,180
18.....	1,790	1,470	1,270	1,570	1,180	1,180	4,550	13,700	10,800	3,680	1,570	1,180
19.....	1,790	1,790	1,270	1,470	1,180	1,180	4,400	13,100	10,600	3,540	1,470	1,180
20.....	1,790	1,790		1,470	1,180	1,180	4,550	12,600	9,870	3,400	1,470	1,180
21.....	1,790	1,570		1,470	1,270	1,270	4,850	12,100	8,900	3,270	1,470	1,180
22.....	1,790	1,570		1,470	1,270	1,270	4,850	11,800	7,940	3,140	1,470	1,270
23.....	1,790	1,570		1,370	1,270	1,370	4,700	12,100	7,380	3,010	1,370	1,180
24.....	1,790	1,470		1,370	1,270	1,470	4,550	12,500	7,030	2,880	1,370	1,180
25.....	1,790	1,470		1,370	1,270	1,570	4,550	12,900	6,700	2,820	1,370	1,180
26.....	1,790	1,470		1,370	1,180	1,470	4,400	12,600	6,700	2,750	1,270	1,180
27.....	1,790	1,570		1,370	1,180	1,470	4,250	11,300	6,380	2,750	1,270	1,180
28.....	1,790	1,680		1,370	1,180	1,370	4,400	10,300	6,380	2,500	1,270	1,270
29.....	1,900	1,570				1,370	4,400	9,420	6,220	2,320	1,270	1,270
30.....	1,900	1,570				1,370	4,250	8,760	6,060	2,140	1,270	1,270
31.....	1,790					1,370		8,340		2,110	1,180	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 700 and 17,000 second-feet. Discharge estimated, owing to lack of gage readings, as follows: Dec. 20-31, 1,400 second-feet; Jan. 1-7, 1,600 second-feet; Jan. 29-31, 1,300 second-feet; and Feb. 1-12, 1,250 second-feet. Discharge interpolated, owing to lack of gage readings, May 24, June 21, July 4, 5, 21, 25, 29, 31, Aug. 1 and 2.

Monthly discharge of Okanogan River at Okanogan, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2,020	1,270	1,630	100,000	A.
November.....	1,790	1,470	1,590	94,600	A.
December.....			1,370	84,200	B.
January.....			1,520	93,500	C.
February.....			1,230	68,300	C.
March.....	1,570	1,100	1,250	76,900	A.
April.....	4,850	1,370	3,330	198,000	A.
May.....	13,700	4,400	9,480	583,000	B.
June.....	12,400	6,060	8,650	515,000	B.
July.....	6,060	2,110	3,990	245,000	A.
August.....	2,080	1,180	1,610	99,000	A.
September.....	1,270	1,100	1,160	69,000	A.
The year.....	13,700		3,070	2,230,000	

SIMILKAMEEN RIVER NEAR OROVILLE, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 13, T. 40 N., R. 26 E., at the North Washington Power Co. plant, 4 miles above Oroville, 5 miles above the mouth, and below all tributaries.

DRAINAGE AREA.—3,450 square miles.

RECORDS AVAILABLE.—May 14, 1911, to September 30, 1914.

GAGE.—Vertical staff in seven sections, on left side of stream, three sections 15 feet above tailrace and four sections nailed to outside of power house.

DISCHARGE MEASUREMENTS.—Made from highway bridge at Oroville, 4 miles below the gage.

CHANNEL AND CONTROL.—Rock and gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.75 feet at 5 p. m. May 16 and 17 (discharge, 12,900 second-feet); minimum stage recorded, 1.2 feet at 8 a. m. December 25 (discharge, 388 second-feet).

1911-1914: Maximum stage recorded, 16.9 feet at 7.30 a. m. and 5 p. m. June 4, 1913 (discharge, 17,900 second-feet); minimum stage recorded, 0.80 foot at 8 a. m. March 20, 1913 (discharge, 280 second-feet).

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—Some diversion for irrigation from tributaries above the station.

COOPERATION.—Gage-height record furnished by the North Washington Power Co.

Discharge measurements of Similkameen River near Oroville, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
Oct. 10	F. B. Storey.....	<i>Feet.</i> 1.65	<i>Sec.-ft.</i> 520	June 23	C. O. Brown.....	<i>Feet.</i> 8.42	<i>Sec.-ft.</i> 5,500
June 21	C. O. Brown.....	9.45	6,760	Aug. 20	.....do.....	1.80	604
22	.....do.....	8.85	6,060	Sept. 10	.....do.....	1.40	454

Daily discharge, in second-feet, of Similkameen River near Oroville, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	602	1,010	730	526	564	526	775	2,990	8,060	4,250	1,010	454
2.....	602	960	730	490	564	526	730	4,150	9,600	4,350	960	454
3.....	564	910	730	526	545	526	775	6,030	11,200	4,150	910	454
4.....	564	910	685	490	525	526	685	6,980	10,800	4,060	865	454
5.....	564	865	602	526	510	526	685	6,140	9,180	3,790	820	420
6.....	564	865	602	526	490	490	775	5,810	8,060	3,610	820	420
7.....	564	820	602	642	490	490	1,060	5,590	7,240	3,430	775	420
8.....	564	775	602	910	480	490	1,270	5,370	6,730	2,910	775	420
9.....	564	775	602	960	470	490	1,510	5,590	6,250	2,750	775	454
10.....	564	775	564	910	470	490	1,750	6,250	6,030	2,590	820	490
11.....	564	775	526	865	480	490	2,000	6,610	5,810	2,510	775	490
12.....	602	730	526	820	490	454	2,280	7,240	6,030	2,350	730	454
13.....	1,160	685	564	775	500	490	2,430	8,200	7,240	2,430	685	454
14.....	1,160	642	642	775	510	490	2,750	9,320	8,060	2,590	685	454
15.....	1,160	602	602	775	520	490	3,070	12,200	8,340	2,430	602	454
16.....	1,060	642	564	775	520	526	3,520	12,700	9,040	2,210	602	490
17.....	1,010	685	564	775	520	526	3,430	12,800	9,740	2,000	602	526
18.....	960	820	564	775	526	526	3,340	12,100	9,460	1,870	602	490
19.....	910	960	564	730	526	564	3,610	11,200	8,480	1,810	602	525
20.....	910	910	564	685	526	602	3,790	10,600	7,500	1,690	602	564
21.....	1,010	865	526	642	564	642	3,520	10,400	6,850	1,630	602	602
22.....	1,010	775	526	642	564	685	3,340	10,900	6,030	1,510	564	602
23.....	1,010	685	490	642	564	775	3,160	11,200	5,590	1,390	564	564
24.....	1,110	730	404	602	526	820	2,990	11,500	5,050	1,270	564	564
25.....	1,390	775	404	564	526	775	2,910	11,600	4,950	1,270	526	564
26.....	1,270	865	454	602	526	775	2,990	10,800	4,950	1,270	526	602
27.....	1,110	865	526	602	526	730	3,070	9,040	4,550	1,270	526	602
28.....	1,060	820	526	564	526	730	3,070	8,480	4,650	1,160	490	602
29.....	1,010	775	564	564	.....	775	2,910	7,780	4,350	1,110	490	685
30.....	1,010	775	526	564	.....	730	2,910	7,110	4,350	1,060	490	642
31.....	960	.....	526	564	.....	775	.....	8,060	.....	1,010	454	.....

NOTE.—Discharge determined from a rating curve well defined between 300 and 13,000 second-feet. Discharge estimated, because of ice, Feb. 3-5 and 7-17.

Monthly discharge, of Similkameen River near Oroville, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	1,390	564	883	54,300	A.
November.....	1,010	602	802	47,700	A.
December.....	730	404	568	34,900	A.
January.....	960	490	671	41,300	A.
February.....	564	470	520	28,900	C.
March.....	820	454	595	36,600	A.
April.....	3,790	685	2,370	141,000	A.
May.....	12,800	2,990	8,540	525,000	A.
June.....	11,200	4,350	7,140	425,000	A.
July.....	4,350	1,010	2,310	142,000	A.
August.....	1,010	454	671	41,300	A.
September.....	685	420	512	30,500	A.
The year.....	12,800	404	2,140	1,550,000	

SALMON CREEK NEAR CONCONULLY, WASH.¹

LOCATION.—In sec. 18, T. 35 N., R. 25 E., about one-half mile below Conconully reservoir of United States Reclamation Service Okanogan project, 2 miles south of Conconully and about 14 miles above Okanogan.

DRAINAGE AREA.—121 square miles (revised value); 152 square miles at Jones ranch.

¹ Formerly described as near Okanogan.

RECORDS AVAILABLE.—July 6, 1910, to September 30, 1914. From May 27, 1903, to March 31, 1912, records were obtained at Jones ranch in sec. 31, T. 34 N., R. 26 E., about 6 miles above Okanogan.

GAGE.—Vertical staff indicating head on weir.

DISCHARGE MEASUREMENTS.—Made from footbridge near gage.

CHANNEL AND CONTROL.—20-foot rectangular, sharp-crested weir with two end contractions; prior to October 1, 1912, a 20-foot Cippoletti weir was used.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.22 feet, 6 a. m. to midnight May 24 (discharge, 247 second-feet); minimum stage recorded, 0.08 foot September 12-30 (discharge, 1.7 second-feet).

1903-1914: Maximum stage recorded, 3.63 feet April 29, 1904 (discharge, 577 second-feet); minimum stage recorded, zero 4 p. m. October 3, to 6 p. m. October 11, 1910, when water was being stored in Salmon and Conconully reservoirs.

WINTER FLOW.—Discharge relation not affected by ice.

DIVERSIONS.—None above the station.

REGULATION.—Flow completely controlled by storage in Salmon Lake reservoir, capacity 2,600 acre-feet, and Conconully reservoir, capacity 13,000 acre-feet. Monthly summaries of flow for 1912-1914 corrected for storage.

ACCURACY.—Theoretical discharge curve for the weir has been modified by current-meter observations to determine the velocity of approach. Discharge for days when reservoir gates are changed determined by weighting discharges.

COOPERATION.—Field data furnished by United States Reclamation Service.

The following discharge measurement was made by C. O. Brown:

June 26, 1914: Gage height, 1.34 feet; discharge, 110 second-feet.

Daily discharge, in second-feet, of Salmon Creek near Conconully, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1.9	4.7	1.9	1.9	2.1	2.1	2.5	3.9	190	96	106	90
2.....	1.9	3.3	1.9	1.9	2.1	2.1	2.5	3.9	208	100	107	2.1
3.....	1.9	1.9	1.9	1.9	2.1	2.1	2.5	4.7	215	100	109	2.1
4.....	1.9	1.9	1.9	1.9	2.1	2.1	2.5	4.7	237	100	117	2.1
5.....	1.9	1.9	1.9	1.9	2.1	2.1	2.5	15.3	243	100	117	2.1
6.....	1.9	1.9	1.9	2.1	2.1	2.1	2.5	30	212	101	117	2.1
7.....	4.0	1.9	1.9	2.1	2.1	2.1	2.5	48	174	106	117	2.1
8.....	4.9	1.9	1.9	2.1	2.1	2.1	2.5	58	163	111	117	2.1
9.....	1.9	1.9	1.9	2.1	2.1	2.1	2.5	64	163	117	117	2.1
10.....	1.9	1.9	1.9	2.1	2.1	2.1	2.5	68	156	120	115	16.5
11.....	1.9	1.9	1.9	2.1	2.1	2.1	2.5	76	150	121	100	14.1
12.....	2.8	1.9	1.9	2.1	2.1	2.1	2.5	93	141	125	100	1.7
13.....	4.3	1.9	1.9	2.1	2.1	2.1	2.8	94	142	121	100	1.7
14.....	3.0	1.9	1.9	2.1	2.1	2.1	2.8	98	157	101	100	1.7
15.....	3.6	1.9	1.9	2.1	2.1	2.1	3.2	100	183	100	99	1.7
16.....	3.6	1.9	1.9	2.1	2.1	2.1	3.2	106	194	92	95	1.7
17.....	3.6	1.9	1.9	2.1	2.1	2.1	3.2	109	194	94	97	1.7
18.....	3.6	1.9	1.9	2.1	2.1	2.1	3.2	111	194	91	108	1.7
19.....	3.6	1.9	1.9	2.1	2.1	2.5	3.2	168	179	93	108	1.7
20.....	3.6	1.9	1.9	2.1	2.1	2.5	3.2	203	133	94	108	1.7
21.....	3.6	1.9	1.9	2.1	2.1	2.5	3.2	213	110	103	108	1.7
22.....	3.6	1.9	1.9	2.1	2.1	2.5	3.2	233	111	103	108	1.7
23.....	3.6	1.9	1.9	2.1	2.1	2.5	3.2	241	113	108	83	1.7
24.....	5.7	1.9	1.9	2.1	2.1	2.5	3.2	246	112	108	72	1.7
25.....	5.2	1.9	1.9	2.1	2.1	2.5	3.6	242	106	109	112	1.7
26.....	4.7	1.9	1.9	2.1	2.1	2.5	3.6	200	106	109	116	1.7
27.....	4.7	1.9	1.9	2.1	2.1	2.5	3.9	163	102	107	118	1.7
28.....	4.7	1.9	1.9	2.1	2.1	2.5	3.9	129	99	98	119	1.7
29.....	4.7	1.9	1.9	2.1	.....	2.5	3.9	121	98	96	119	1.7
30.....	4.7	1.9	1.9	2.1	.....	2.5	3.9	132	93	98	119	1.7
31.....	4.7	.....	1.9	2.1	.....	2.5	.....	153	.....	102	119	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Salmon Creek near Conconully, Wash., for year ending Sept. 30, 1914.

[Drainage area, 1,21 square miles.]

Month.	Observed discharge in second-feet.			Run-off in acre-feet.			Mean discharge without storage in second-feet.	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.		
October.....	5.7	1.9	3.47	213	+ 294	507	8.25	A.
November.....	4.7	1.9	2.04	121	+ 467	588	9.98	A.
December.....	1.9	1.9	1.90	117	+ 329	446	7.25	A.
January.....	2.1	1.9	2.07	127	+ 439	566	9.21	A.
February.....	2.1	2.1	2.10	117	+ 219	336	6.05	A.
March.....	2.5	2.1	2.27	140	+ 338	478	7.77	A.
April.....	3.9	2.5	3.01	179	+3,282	3,461	58.2	A.
May.....	246	3.9	114	7,010	+4,463	11,473	187	A.
June.....	243	93	156	9,283	— 106	9,177	154	A.
July.....	125	91	104	6,395	-4,126	2,269	36.9	A.
August.....	119	72	108	6,641	-6,190	451	7.33	A.
September.....	90	1.7	5.66	337	+ 363	700	11.8	A.
The year.....	246	1.7	42.4	30,680	— 228	30,452	42.1	

METHOW RIVER AT PATEROS, WASH.

LOCATION.—In sec. 35, T. 30 N., R. 23 E., three-fourths of a mile above the old county bridge at Pateros.

DRAINAGE AREA.—1,850 ¹ square miles.

RECORDS AVAILABLE.—May 3, 1903, to September 30, 1914.

GAGE.—Inclined staff on left bank.

DISCHARGE MEASUREMENTS.—Made from a cable 500 feet above the gage.

CHANNEL AND CONTROL.—Gravel and small boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.25 feet at 2 p. m. June 3 (discharge, 11,500 second-feet); minimum flow estimated at 230 second-feet February 5 and 6, from temperature records and observer's notes during period when discharge relation was affected by ice.

1903-1914: Maximum stage recorded, 11.60 feet May 11, 1910 (discharge, 14,800 second-feet); minimum flow estimated at 230 second-feet February 5 and 6, 1914, from temperature records and observer's notes during period when discharge relation was affected by ice.

WINTER FLOW.—Discharge relation seriously affected by ice, and estimated from a study of discharge measurements, observer's notes, and weather records.

DIVERSIONS.—Considerable water for irrigation is diverted above the station.

ACCURACY.—Results good.

Discharge measurements of Methow River at Pateros, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 4	F. B. Storey.....	4.10	397	June 28	C. O. Brown.....	7.15	3,640
5	.....do.....	4.10	395	Aug. 18	.....do.....	4.31	514
June 28	C. O. Brown.....	7.18	3,730	19	.....do.....	4.29	505

¹ Revised measurement.

Daily discharge, in second-feet, of Methow River at Pateros, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	405	455	455	360	382	320	632	3,280	8,020	4,500	830	404
2.....	400	445	430	360	382	320	658	4,900	9,430	4,700	792	382
3.....	396	435	405	360	296	313	658	6,870	11,100	5,100	755	382
4.....	405	435	382	360	320	313	690	6,410	8,460	4,500	720	382
5.....	405	445	382	360	230	313	798	5,750	7,020	3,760	685	369
6.....	387	455	382	360	230	313	958	5,320	6,140	3,400	685	364
7.....	425	455	382	382	242	313	1,360	5,320	5,300	3,080	685	382
8.....	415	445	360	382	242	313	1,660	4,900	4,700	2,780	652	428
9.....	405	440	340	360	242	320	2,090	4,900	4,120	2,640	620	452
10.....	410	440	285	340	255	320	2,250	4,900	3,940	2,500	620	452
11.....	415	440	340	382	360	320	2,590	5,110	3,760	2,500	590	452
12.....	415	430	382	360	510	320	3,100	5,320	4,120	2,500	560	452
13.....	425	405	382	360	538	320	3,280	5,750	4,900	2,640	560	452
14.....	435	396	360	360	565	340	3,470	7,560	5,700	2,500	532	452
15.....	435	405	360	360	538	340	3,660	9,670	6,800	2,360	504	452
16.....	435	415	360	382	510	360	3,470	10,200	7,740	2,100	504	452
17.....	435	425	360	382	510	382	3,280	9,910	8,460	1,980	504	478
18.....	445	435	360	360	482	382	3,280	9,430	7,980	1,980	504	504
19.....	435	430	360	360	455	405	3,280	8,950	7,020	1,860	504	504
20.....	445	410	285	360	455	405	3,860	8,480	6,360	1,750	504	560
21.....	445	387	320	340	482	455	3,660	8,710	5,300	1,640	504	560
22.....	455	392	382	360	405	482	3,470	8,950	4,500	1,440	478	532
23.....	455	378	360	302	340	538	3,280	9,430	3,760	1,340	478	532
24.....	455	382	360	245	320	565	3,280	10,200	3,760	1,340	452	504
25.....	455	396	360	360	320	565	3,100	9,670	3,940	1,250	452	532
26.....	466	415	360	320	320	565	3,100	8,250	3,760	1,160	452	560
27.....	455	435	360	320	320	565	3,280	7,100	3,760	1,160	452	652
28.....	455	435	360	285	320	595	3,100	6,410	3,760	1,080	452	755
29.....	460	440	340	320	.....	595	2,930	5,750	3,760	990	428	720
30.....	455	445	340	340	.....	625	3,100	5,750	4,120	990	428	685
31.....	455	.....	360	405	.....	625	.....	6,640	.....	846	409	.....

NOTE.—Discharge determined as follows: Oct. 1 to June 3, from a rating curve well defined between 400 and 10,000 second-feet; June 4 to Sept. 30, from a rating curve well defined between 300 and 5,000 second-feet. Discharge estimated, because of ice, from observer's notes and climatic records, Jan. 28-30 and Feb. 4-13.

Monthly discharge of Methow River at Pateros, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	466	387	432	26,600	A.
November.....	455	378	425	25,300	A.
December.....	455	285	363	22,300	B.
January.....	405	245	351	21,600	B.
February.....	565	α 230	378	21,000	C.
March.....	625	313	416	25,600	A.
April.....	3,860	632	2,580	154,000	A.
May.....	10,200	3,280	7,090	436,000	A.
June.....	11,100	3,760	5,720	340,000	B.
July.....	5,100	846	2,330	143,000	A.
August.....	830	409	558	34,300	A.
September.....	755	364	493	29,300	A.
The year.....	11,100	α 230	1,770	1,280,000	

α Estimated.

STEHEKIN RIVER AT STEHEKIN, WASH.

LOCATION.—In the SW. $\frac{1}{4}$ sec. 26, T. 33 N., R. 17 E., one-fourth mile below Boulder Creek, 1 mile above Stehekin, and $1\frac{1}{2}$ miles above Lake Chelan.

DRAINAGE AREA.—368 square miles.

RECORDS AVAILABLE.—December 6, 1910, to September 30, 1914.

GAGE.—Inclined and vertical staff on the left bank used beginning August 19, 1911; prior to that date the station was at the pipe-line trestle of Hotel Fields at Stehekin.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet below the gage or by wading.

CHANNEL AND CONTROL.—Banks low and may overflow in extreme floods; bed composed of small boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.38 feet at 4.30 p. m. June 2 (discharge, 6,380 second-feet); minimum stage recorded, 0.25 foot at 4.30 p. m. January 4 (discharge, 189 second-feet).

1910-1914: Maximum stage recorded, 6.0 feet June 12, 1911 (discharge, 11,400 second-feet); minimum discharge estimated at 150 second-feet March 10, 1911, from very doubtful reading and statement by observer that river fell to a very low stage.

WINTER FLOW.—Discharge relation not affected by ice.

ACCURACY.—Results good.

Discharge measurements of Stehekin River at Stehekin, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
July 4	C. O. Brown.....	Feet. 4.25	Sec.-ft. 4,090
4	do.....	4.14	3,960
Sept. 17	do.....	.83	416

Daily discharge, in second-feet, of Stehekin River at Stehekin, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	474	448	398	219	291	254	655	2,480	4,360	4,750	1,640	800
2.....	500	423	352	235	272	254	620	4,360	6,420	4,360	1,550	800
3.....	448	423	352	235	291	235	620	4,060	5,560	5,150	1,550	775
4.....	423	398	352	189	272	235	725	3,770	3,650	4,000	1,550	750
5.....	375	448	352	203	219	235	920	3,470	3,490	3,170	1,640	725
6.....	331	474	352	590	254	235	1,100	3,180	3,020	2,880	1,460	725
7.....	318	423	352	800	254	235	1,550	2,880	3,490	2,740	1,280	800
8.....	352	398	331	620	254	254	1,640	2,740	3,330	3,170	1,060	620
9.....	291	398	310	500	235	272	2,030	2,740	3,020	2,880	1,100	530
10.....	375	423	310	500	235	272	2,240	3,020	3,330	2,740	1,280	590
11.....	1,460	398	310	500	235	272	2,480	3,140	3,020	3,020	1,370	560
12.....	1,100	352	310	448	235	291	2,480	3,250	3,490	3,170	1,460	474
13.....	1,100	352	310	448	235	310	2,480	3,370	3,490	3,020	1,370	423
14.....	800	352	272	448	219	500	2,610	3,480	4,180	2,880	1,460	423
15.....	725	375	272	398	219	474	2,610	3,600	5,150	2,740	1,460	423
16.....	620	880	272	398	203	500	2,740	3,720	6,200	2,480	1,190	423
17.....	590	530	272	423	219	690	2,240	3,830	6,200	2,480	1,140	423
18.....	590	500	272	398	219	920	2,130	3,950	5,350	2,610	1,060	655
19.....	655	448	254	375	219	965	3,020	4,060	4,180	2,740	1,140	760
20.....	655	423	235	352	219	1,060	2,610	4,180	3,490	2,240	1,280	655
21.....	655	398	235	375	235	1,060	2,480	4,950	2,740	1,640	1,280	560
22.....	620	398	235	352	235	1,080	2,240	4,950	2,240	1,550	1,060	620
23.....	725	398	235	331	219	1,100	2,130	5,770	2,030	1,640	1,060	620
24.....	1,010	448	235	331	219	1,100	2,030	5,350	2,030	1,640	1,060	690
25.....	760	423	235	331	235	1,060	1,930	4,180	2,240	1,640	1,060	760
26.....	690	398	235	310	235	880	1,830	3,330	2,240	1,550	1,060	1,280
27.....	620	448	235	310	235	840	1,830	2,740	2,480	1,550	1,010	800
28.....	620	423	219	310	254	800	1,730	2,480	2,610	1,460	1,140	655
29.....	560	423	219	291	.....	760	1,640	2,480	3,020	1,460	1,060	590
30.....	500	398	235	291	.....	690	2,030	2,480	4,000	1,460	965	655
31.....	500	.....	219	291	.....	655	.....	3,330	.....	1,640	800	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated, owing to lack of gage readings, Mar. 22; May 3-6, and 11-19; Aug. 24; Sept. 3-4, and 24.

Monthly discharge of Stehekin River at Stehekin, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 368 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	1,460	291	627	1.70	1.96	38,600	A.
November.....	880	352	434	1.18	1.32	25,800	A.
December.....	398	219	283	.769	.89	17,400	A.
January.....	800	189	381	1.04	1.20	23,400	A.
February.....	291	203	238	.647	.67	13,200	A.
March.....	1,100	235	596	1.62	1.87	36,600	A.
April.....	3,020	620	1,910	5.19	5.79	114,000	A.
May.....	5,770	2,480	3,590	9.76	11.25	221,000	B.
June.....	6,420	2,030	3,670	9.97	11.12	218,000	A.
July.....	5,150	1,460	2,600	7.07	8.15	160,000	A.
August.....	1,640	800	1,240	3.37	3.88	76,200	A.
September.....	1,280	423	652	1.77	1.98	38,800	A.
The year.....	6,420	189	1,360	3.70	50.08	983,000	

LAKE CHELAN AT CHELAN, WASH.

LOCATION.—In sec. 13, T. 27 N., R. 22 E., at the Forest Service boat landing at Chelan, about one-fourth mile above highway bridge at outlet.

DRAINAGE AREA.—951 square miles.

RECORDS AVAILABLE.—September 1 to October 15, 1897; January 1, 1898, to December 31, 1899; January 1 to June 30, 1905; December 5, 1910, to September 30, 1914,

GAGE.—Vertical staff nailed to a pile at boat landing, installed December 5, 1910, datum at elevation, 1,076.16 feet above sea level; 1897–1899 gage was at Lakeside, about 1 mile west of Chelan; datum at elevation, 1,070.18 feet above sea level; in 1905 gage was attached to a bent of the upper bridge at Chelan and was not referred to sea-level datum.

EXTREMES OF STAGE.—Maximum stage recorded during year, 5.30 feet (elevation, 1,081.46 feet), at 8.30 a. m. May 25; minimum stage recorded, 2.00 feet (elevation, 1,078.16 feet), at 8.30 a. m. April 6.

1898–1899 and 1911–1914: Maximum stage recorded, 6.70 feet (elevation, 1,082.86 feet) at 9 a. m. June 9, 1913; minimum stage recorded, 6.60 feet (elevation 1,076.78 feet) January 27–28 and December 2–5, 1898.

REGULATION.—The height of water in the lake is controlled by operation of gates in the dam at the outlet.

COOPERATION.—Gage-height record since December, 1910, furnished by United States Forest Service.

Daily gage height, in feet, of Lake Chelan at Chelan, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			3.30						4.80			
2					3.20	3.10						
3		3.25									2.70	
4								3.40				
5				2.95								
6	3.15						2.00			4.55		
7												
8			3.10						4.80			3.30
9					3.05	2.95						
10		3.25									2.35	
11								3.70				
12				3.30								
13							2.50					
14	3.30											3.10
15			3.05						4.40			
16					3.00	3.05						
17		3.30									2.70	
18								4.70				
19				3.25								
20	3.30						3.00			3.95		
21												3.30
22			3.00						4.85			
23					3.05	2.90						
24		3.20										
25								5.30				
26												
27	3.30			3.30			3.10			3.20		
28												3.35
29			2.90									
30						2.30			4.20			
31											3.15	

CHELAN RIVER AT CHELAN, WASH.

LOCATION.—In sec. 13, T. 27 N., R. 22 E., at the lower highway bridge at Chelan 1,000 feet below outlet of lake, and 4 miles above Chelan Falls.

DRAINAGE AREA.—951 square miles.

RECORDS AVAILABLE.—November 6, 1903, to September 30, 1914.

GAGE.—Vertical staff attached to pile bent of bridge.

DISCHARGE MEASUREMENTS.—Made from new highway bridge at outlet.

CHANNEL AND CONTROL.—Rocks and clay; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.8 feet at 8 a. m.

May 26 (discharge, 6,820 second-feet); minimum stage recorded, 4.70 feet at 8.30 a. m. December 26 and 30 (discharge, 424 second-feet).

1903-1914: Maximum stage recorded, 10.7 feet May 14, 1910 (discharge, 9,810 second-feet); minimum stage recorded, 4.35 feet December 17, 1910 (discharge, 245 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

REGULATION.—Flow partly controlled by storage in Lake Chelan.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Chelan River at Chelan, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.
July 1	Brown and Muldrow	<i>Feet.</i>	<i>Sec.-ft.</i>
2	C. O. Brown	8.77	4,950
Sept. 18	do	8.84	5,100
		5.23	658

Daily discharge, in second-feet, of Chelan River at Chelan, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	868	706	678	454	692	516	2,050	3,280	5,820	5,180	2,850	650
2.....	736	665	678	463	706	528	2,050	3,280	6,140	5,180	2,780	624
3.....	736	624	678	463	598	484	1,920	3,590	6,480	5,500	2,710	650
4.....	706	706	650	496	550	505	1,920	3,900	6,650	5,500	2,440	767
5.....	652	706	624	528	706	505	1,920	3,900	6,480	5,500	2,440	767
6.....	598	800	598	598	624	505	1,920	4,060	6,480	5,500	2,440	708
7.....	650	736	586	678	598	550	1,920	4,060	6,310	5,340	2,310	650
8.....	661	736	574	706	586	528	1,920	4,220	6,140	5,340	2,180	706
9.....	672	693	598	678	574	505	2,050	4,220	5,820	5,180	2,120	767
10.....	682	650	598	678	550	528	2,180	5,020	5,500	5,180	2,050	706
11.....	693	644	574	678	550	528	2,310	4,220	5,180	5,180	1,450	736
12.....	704	637	550	678	574	550	2,380	4,220	5,180	5,090	1,450	706
13.....	714	630	528	624	484	574	2,440	4,380	5,020	5,090	1,240	665
14.....	725	624	528	678	505	528	2,440	4,540	5,100	4,910	1,240	624
15.....	736	598	528	767	494	539	2,550	5,020	5,180	4,810	1,200	650
16.....	736	638	528	736	484	550	2,990	5,500	5,500	4,720	842	550
17.....	736	678	528	706	484	598	2,990	5,660	5,820	4,630	484	706
18.....	706	678	528	736	463	624	2,990	5,820	6,140	4,540	484	650
19.....	706	650	505	767	484	1,450	3,060	5,820	6,220	4,540	505	736
20.....	706	678	484	767	484	2,180	3,130	5,980	6,310	4,540	528	736
21.....	736	678	474	767	505	2,710	3,280	5,980	6,140	4,220	525	736
22.....	706	767	463	767	494	2,850	3,280	6,140	5,980	4,060	522	736
23.....	736	736	484	736	484	2,990	3,280	6,310	5,820	3,900	518	678
24.....	706	706	444	767	484	2,990	3,280	6,480	5,500	3,740	515	706
25.....	736	678	434	752	505	2,710	3,280	6,650	5,500	3,580	512	706
26.....	736	650	424	736	505	2,710	3,280	6,820	5,340	3,580	508	736
27.....	736	664	430	800	550	2,440	3,280	6,480	5,220	3,580	505	768
28.....	800	678	437	678	505	2,440	3,280	6,480	5,100	3,280	650	800
29.....	736	650	444	736	.....	2,310	3,280	6,140	4,980	2,990	598	767
30.....	706	664	424	706	.....	2,180	3,280	6,030	4,860	2,850	611	800
31.....	706	.....	444	678	.....	2,050	.....	5,930	.....	2,850	624	.....

NOTE.—Discharge determined from a well defined rating curve. Discharge interpolated, owing to lack of gage readings, for Sundays and the following periods: Oct. 8-14; Nov. 11-13; Dec. 27, 28; July 5, 12-17; and Aug. 21-26.

Monthly discharge of Chelan River at Chelan, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	868	598	715	44,000	B.
November.....	800	598	678	40,300	B.
December.....	678	424	530	32,600	B.
January.....	800	454	677	41,600	B.
February.....	706	463	544	30,200	B.
March.....	2,990	484	1,340	82,400	A.
April.....	3,280	1,920	2,670	159,000	A.
May.....	6,820	3,280	5,140	316,000	A.
June.....	6,650	4,860	5,730	341,000	A.
July.....	5,500	2,850	4,520	278,000	B.
August.....	2,850	484	1,280	78,700	B.
September.....	800	550	706	42,000	A.
The year.....	6,820	424	2,050	1,490,000	

ENTIAT RIVER AT ENTIAT, WASH.

LOCATION.—In sec. 18, T. 25 N., R. 21 E., one-eighth mile below power house of the Wenatchee Valley Gas & Electric Co., three-fourths mile above Entiat, and about 1 mile above the mouth.

DRAINAGE AREA.—419 square miles.

43855°—WSP 392—16—9

RECORDS AVAILABLE.—October 5, 1910, to September 30, 1914.

GAGE.—Inclined staff on left bank.

DISCHARGE MEASUREMENTS.—Made from private bridge 200 feet below the power house and about one-eighth mile above the gage.

CHANNEL AND CONTROL.—Gravel and small boulders; shifting during extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.9 feet at 12.30 p. m. June 3 (discharge, 2,870 second-feet); minimum flow estimated at 65 second-feet February 7 from temperature record and observer's notes during period when discharge relation was affected by ice.

1910-1914: Maximum stage recorded, 4.4 feet June 3-4, 1913 (discharge, 3,800 second-feet); minimum flow estimated at 65 second-feet February 7, 1914, from temperature record and observer's notes during period when discharge relation was affected by ice.

WINTER FLOW.—Discharge relation affected by ice.

DIVERSIONS.—Entiat Irrigation Co.'s high-line canal, capacity about 20 second-feet, diverts above the gage.

REGULATION.—Flow affected somewhat by changes in load when the power plant is in operation.

ACCURACY.—Results good.

COOPERATION.—Gage heights furnished by Wenatchee Valley Gas & Electric Co.

The following discharge measurement was made by C. O. Brown:

July 7, 1914: Gage height, 2.50 feet; discharge, 965 second-feet.

Daily discharge, in second-feet, of Entiat River at Entiat, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	146	158	158	137	171	171	250	870	1,910	1,330	311	134
2.....	146	158	156	139	146	171	250	1,060	2,530	1,330	268	134
3.....	146	158	158	139	92	158	268	1,510	2,870	1,330	268	134
4.....	141	158	134	139	74	158	311	1,510	2,700	1,390	231	146
5.....	141	158	134	137	74	158	311	1,510	2,060	1,060	231	134
6.....	134	171	134	171	74	171	388	1,390	1,770	960	215	123
7.....	134	166	134	166	65	171	415	1,330	1,510	915	215	123
8.....	146	158	134	231	83	156	545	1,270	1,220	870	199	123
9.....	146	158	125	215	112	158	620	1,270	1,160	870	215	123
10.....	146	158	123	209	139	185	700	1,220	1,060	870	215	134
11.....	146	158	134	199	151	185	700	1,330	1,060	780	215	134
12.....	146	158	134	193	156	199	740	1,390	1,010	780	215	123
13.....	146	158	134	185	161	199	825	1,510	1,060	870	215	123
14.....	158	134	146	185	161	199	870	1,770	1,450	825	199	130
15.....	158	137	146	185	158	231	915	2,060	1,510	740	185	128
16.....	171	171	146	185	156	231	915	2,530	2,060	660	185	134
17.....	171	171	158	179	146	231	870	2,370	2,370	620	199	134
18.....	171	185	158	177	158	250	870	2,210	2,370	700	185	171
19.....	146	177	158	177	156	261	915	2,210	2,210	780	171	199
20.....	171	158	151	171	156	268	960	2,060	1,770	660	171	171
21.....	171	151	119	171	146	215	1,010	2,210	1,510	660	185	158
22.....	171	151	123	168	146	336	1,060	2,370	1,270	477	185	146
23.....	171	171	158	171	141	336	960	2,370	1,060	446	171	146
24.....	166	158	134	119	166	360	915	2,700	1,060	415	158	130
25.....	166	158	134	158	161	360	915	2,700	1,110	415	158	146
26.....	161	158	134	166	146	336	915	2,210	1,110	388	158	158
27.....	161	171	134	158	146	311	870	1,770	1,110	360	158	199
28.....	161	158	134	158	171	311	825	1,770	1,110	360	158	199
29.....	158	171	134	156	.....	268	780	1,390	1,110	336	158	185
30.....	158	171	134	182	.....	231	870	1,510	1,220	311	146	171
31.....	158	.....	139	171	.....	250	.....	1,510	.....	311	134	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge estimated because of ice, from observer's notes, and climatic records, Feb. 3-12.

Monthly discharge of Entiat River at Entiat, Wash., for the year ending September 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	171	134	155	9,530	A.
November.....	185	134	161	9,580	A.
December.....	158	119	140	8,610	A.
January.....	231	119	171	10,500	A.
February.....	171	65	136	7,550	B.
March.....	360	156	233	14,300	A.
April.....	1,060	250	725	43,100	A.
May.....	2,700	870	1,770	109,000	A.
June.....	2,870	1,010	1,580	94,000	A.
July.....	1,390	311	736	45,300	A.
August.....	311	134	196	12,100	A.
September.....	199	123	146	8,690	A.
The year.....	2,870	65	514	372,000	

WENATCHEE RIVER NEAR LEAVENWORTH, WASH.

LOCATION.—In sec. 12, T. 26 N., R. 17 E., at Nickles ranch, half a mile below Beaver Creek and about 14 miles north of Leavenworth.

DRAINAGE AREA.—591 square miles.

RECORDS AVAILABLE.—November 28, 1910, to September 30, 1914.

GAGE.—Inclined and vertical staff gage on left bank since September 6, 1913; prior to this date a vertical staff at same site.

DISCHARGE MEASUREMENTS.—Made from cable three-eighths mile above gage.

CHANNEL AND CONTROL.—Gravel and small bowlders; shifting in floods; discharge relation affected by logs lodging on control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.65 feet at 6 a. m. May 16 (discharge, 8,700 second-feet); minimum stage recorded, 2.83 feet at 6 p. m. September 13 (discharge, 482 second-feet).

1910-1914: Maximum stage recorded, 9.6 feet at 6 p. m. June 3, and at 8 a. m. and 6 p. m. June 4, 1913 (discharge, 14,500 second-feet); minimum stage recorded, 2.83 feet at 6 p. m. September 13, 1914 (discharge, 482 second-feet).

WINTER FLOW.—Discharge relation affected by ice during severe winters.

ACCURACY.—Results good.

Discharge measurements of Wenatchee River near Leavenworth, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
Feb. 10	F. B. Storey.....	<i>Feet.</i> 3.04	<i>Sec.-ft.</i> 657	July 11	C. O. Brown.....	<i>Feet.</i> 5.22	<i>Sec.-ft.</i> 3,270
11	.....do.....	3.03	660	Aug. 15	.....do.....	3.43	994

Daily discharge, in second-feet, of Wenatchee River near Leavenworth, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	750	1,100	1,290	591	835	880	1,520	3,510	5,100	4,320	1,400	658
2.....	750	1,010	1,290	615	790	880	1,350	5,100	6,500	4,700	1,340	615
3.....	735	970	1,180	615	700	880	1,350	6,500	7,760	4,700	1,290	658
4.....	720	930	1,080	615	790	880	1,560	6,500	6,500	4,510	1,240	615
5.....	720	970	1,060	880	700	858	1,870	5,500	5,100	4,320	1,240	575
6.....	702	1,100	1,030	1,180	615	835	2,070	4,900	4,700	3,960	1,240	575
7.....	720	1,060	1,030	1,880	658	817	2,250	4,900	3,780	3,440	1,180	575
8.....	720	1,010	1,030	2,140	700	835	2,510	4,700	3,610	3,280	1,080	615
9.....	750	1,010	980	2,010	700	880	2,940	4,700	2,970	3,120	1,030	575
10.....	750	1,010	880	1,880	658	880	3,360	4,900	2,970	3,120	980	575
11.....	1,410	1,010	880	1,760	658	880	3,670	4,700	3,120	2,970	980	498
12.....	1,880	970	880	1,640	658	880	4,340	5,100	3,280	3,280	1,030	498
13.....	1,880	950	835	1,520	615	930	4,340	5,540	3,610	3,280	1,030	482
14.....	1,880	930	835	1,400	615	980	4,340	7,250	4,510	3,120	980	498
15.....	1,640	898	790	1,340	615	1,290	4,700	8,560	5,100	2,970	1,030	615
16.....	1,640	1,060	790	1,290	575	1,400	4,520	8,560	6,260	2,760	1,080	615
17.....	1,410	2,140	745	1,240	575	1,640	4,160	7,760	7,000	2,540	1,030	615
18.....	1,360	2,010	745	1,180	575	1,880	3,830	6,750	6,880	2,540	930	745
19.....	1,460	2,010	700	1,080	575	2,140	4,340	6,500	6,750	2,400	835	980
20.....	1,460	1,760	700	1,030	575	2,140	5,700	6,500	5,320	2,400	835	980
21.....	1,520	1,640	700	1,030	575	2,400	4,900	6,750	4,320	2,010	880	880
22.....	1,520	1,550	658	980	615	2,540	4,520	7,250	3,780	1,760	880	858
23.....	1,520	1,460	658	980	615	2,540	4,160	7,500	3,280	1,760	835	835
24.....	1,520	1,520	658	880	615	2,540	3,990	8,020	3,120	1,760	790	790
25.....	1,640	1,520	658	880	615	2,400	3,670	7,000	3,440	1,760	768	790
26.....	1,520	1,520	615	880	615	2,140	3,510	6,020	3,440	1,640	745	880
27.....	1,410	1,520	615	880	880	2,140	3,510	5,540	3,610	1,520	745	1,080
28.....	1,300	1,460	615	880	930	2,010	3,210	4,510	3,440	1,520	745	980
29.....	1,300	1,400	599	835	.....	1,880	3,060	3,960	3,610	1,400	790	880
30.....	1,150	1,400	599	880	.....	1,760	3,060	4,140	3,960	1,370	745	790
31.....	1,100	.....	615	835	.....	1,640	.....	4,510	.....	1,400	700	.....

NOTE.—Discharge determined from two well-defined rating curves (except Apr. 2 to May 10). The first applicable Oct. 1, 1913, to Nov. 16, 1913; the second applicable Nov. 17 to Apr. 1 and May 11 to Sept. 30. Discharge relation Apr. 2 to May 10 affected by log jam, and discharge determined from a fairly well-defined rating curve based upon discharge measurements during the period and the fall of stage when the log jam was removed.

Monthly discharge of Wenatchee River near Leavenworth, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October.....	1,880	702	1,250	2.12	2.44	76,900	A.
November.....	2,140	898	1,300	2.20	2.46	77,400	A.
December.....	1,290	599	830	1.40	1.61	51,000	A.
January.....	2,140	591	1,160	1.96	2.26	71,300	A.
February.....	930	575	666	1.13	1.18	37,000	A.
March.....	2,540	817	1,510	2.55	2.94	92,800	A.
April.....	5,700	1,350	3,410	5.77	6.44	203,000	B.
May.....	8,560	3,510	5,920	10.0	11.53	364,000	B.
June.....	7,760	2,970	4,560	7.72	8.61	271,000	A.
July.....	4,700	1,370	2,760	4.67	5.38	170,000	A.
August.....	1,400	700	981	1.66	1.91	60,300	A.
September.....	1,080	482	710	1.20	1.34	42,200	A.
The year.....	8,560	482	2,100	3.55	48.10	1,520,000	

WENATCHEE RIVER AT DRYDEN, WASH.

LOCATION.—In the SW. $\frac{1}{4}$ sec. 26, T. 24 N., R. 18 E., at the power plant of the Wenatches Gas & Electric Co., one-fourth mile above Dryden, $1\frac{1}{4}$ miles below the intake of the Wenatchee Valley canal, 2 miles below Peshastin Creek, and 4 miles above Cashmere.

DRAINAGE AREA.—1,200 square miles.

RECORDS AVAILABLE.—October 1, 1911, to September 30, 1914.

GAGE.—Vertical staff in tailrace of power house.

DISCHARGE MEASUREMENTS.—Made from the highway bridge 1 mile above Cashmere.

CHANNEL AND CONTROL.—Rocky; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.50 feet at 3 a. m. May 16 (discharge, 14,600 second-feet); minimum stage recorded, 0.10 foot September 13–15 (discharge, 675 second-feet.).

1904¹–1914: Maximum stage recorded, 8.80 feet at 6 p. m. June 3, and at 6 a. m. June 4, 1913 (discharge, 24,100 second-feet); minimum stage recorded, –0.02 foot at 10 a. m. September 29, 1912 (discharge, 572 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—The Wenatchee Valley canal is the most important canal diverting above this station. Records are kept on this canal and the results are added to give total flow past gage.

REGULATION.—A small amount of storage in the millpond at Leavenworth.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by the Wenatchee Valley Gas & Electric Co.

Discharge measurements of Wenatchee River at Dryden, Wash., during the year ending Sept. 30, 1914.

[Made by C. O. Brown.]

Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>
July 8.....	3.20	4,620
Aug. 17.....	.90	1,180
Sept. 21.....	.85	1,250

¹ Gaging station called "Wenatchee River at Cashmere," 1904–1910.

Daily discharge, in second-feet, of Wenatchee River at Dryden, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	760	1,400	1,730	880	1,200	1,300	2,110	5,250	8,560	6,430	1,820	905
2.....	760	820	1,610	880	1,110	1,300	1,980	7,440	11,600	6,930	1,500	840
3.....	710	1,020	1,500	820	1,020	1,200	2,110	9,880	12,700	6,930	1,400	840
4.....	710	1,110	1,400	880	1,110	1,200	2,400	10,600	10,600	6,930	1,500	725
5.....	710	1,110	1,400	1,200	1,020	1,200	2,710	8,560	8,560	6,430	1,500	780
6.....	760	1,200	1,300	2,110	940	1,200	3,570	7,980	7,440	5,480	1,500	725
7.....	760	1,300	1,300	3,380	940	1,110	3,760	7,440	5,710	4,800	1,500	725
8.....	760	1,200	1,200	3,380	880	1,300	4,360	7,180	5,020	4,580	1,500	725
9.....	760	1,200	1,110	3,030	940	1,610	4,580	7,180	4,580	4,580	1,300	725
10.....	760	1,110	1,200	2,710	940	1,500	5,250	6,930	4,150	4,580	840	725
11.....	1,110	1,200	1,110	2,400	940	1,400	5,710	7,440	4,360	4,150	1,220	725
12.....	2,710	1,200	1,110	2,110	940	1,400	6,190	7,980	4,580	4,360	1,220	725
13.....	2,250	1,110	1,110	1,980	880	1,500	6,930	8,880	5,480	4,580	1,220	675
14.....	2,400	1,110	1,020	1,980	880	1,730	7,180	11,300	6,680	4,150	1,220	675
15.....	2,110	1,110	1,020	1,850	820	2,110	7,700	13,800	7,980	3,950	1,220	675
16.....	1,850	1,610	1,020	1,850	820	2,550	7,700	14,200	9,880	3,570	1,220	725
17.....	1,610	2,870	1,020	1,610	880	2,550	6,930	12,700	10,900	3,060	1,220	840
18.....	1,500	2,710	1,020	1,610	880	2,870	6,430	11,300	10,900	3,220	1,130	840
19.....	1,610	2,400	1,200	1,610	820	3,030	8,560	10,600	9,880	3,060	975	1,050
20.....	1,850	2,250	1,110	1,500	820	3,380	7,700	10,600	8,260	3,060	975	1,220
21.....	1,850	1,850	940	1,400	880	3,380	7,180	10,900	6,190	2,750	975	1,130
22.....	1,850	1,850	940	1,400	880	3,380	6,930	11,600	5,480	2,460	1,050	1,130
23.....	1,730	1,980	940	1,400	880	3,380	6,430	12,000	5,020	2,190	1,050	1,050
24.....	1,850	1,980	880	1,300	940	3,380	5,950	12,700	4,800	2,060	975	975
25.....	2,110	1,980	880	1,200	880	3,200	5,480	11,600	5,480	2,600	975	975
26.....	1,850	1,850	880	1,200	880	3,030	5,480	9,880	5,020	1,710	975	1,130
27.....	1,610	1,980	880	1,200	1,020	2,710	5,020	8,260	5,020	1,820	905	1,400
28.....	1,610	1,850	880	1,200	1,400	2,870	4,800	6,930	5,020	1,940	905	1,300
29.....	1,500	1,730	880	1,200	.....	2,400	4,580	6,680	5,250	1,600	905	1,130
30.....	1,400	1,730	820	1,200	.....	2,400	4,580	6,190	5,710	1,500	905	1,050
31.....	1,400	.....	760	1,200	.....	2,250	.....	6,930	.....	1,130	905	.....

NOTE.—Discharge determined as follows: Oct. 1 to May 16, from a rating curve well defined between 500 and 20,000 second-feet; May 17 to Sept. 30, from a rating curve well defined above 1,000 second-feet.

Monthly discharge of Wenatchee River at Dryden, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2,710	710	1,460	89,800	A.
November.....	2,870	820	1,590	94,600	A.
December.....	1,730	760	1,100	67,600	A.
January.....	3,380	820	1,670	103,000	A.
February.....	1,400	820	948	52,600	B.
March.....	3,380	1,110	2,190	135,000	A.
April.....	8,650	1,980	5,350	318,000	A.
May.....	14,200	5,250	9,380	577,000	A.
June.....	12,700	4,150	7,030	418,000	A.
July.....	6,930	1,130	3,760	231,000	A.
August.....	1,820	840	1,180	72,600	B.
September.....	1,400	675	904	53,800	B.
The year.....	14,200	675	3,060	2,210,000	

Combined monthly discharge of Wenatchee Valley canal and Wenatchee River at Dryden, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2, 770	798	1, 530	94, 100	A.
November.....	2, 870	879	1, 610	95, 800	A.
December.....	1, 730	760	1, 100	67, 600	A.
January.....	3, 380	820	1, 670	103, 000	A.
February.....	1, 400	820	948	52, 600	B.
March.....	3, 380	1, 110	2, 190	135, 000	A.
April.....	3, 690	1, 980	5, 380	320, 000	A.
May.....	14, 300	5, 320	9, 470	582, 000	A.
June.....	12, 800	4, 250	7, 130	424, 000	A.
July.....	7, 030	1, 240	3, 870	238, 000	A.
August.....	1, 930	948	1, 280	79, 300	B.
September.....	1, 450	776	995	59, 200	B.
The year.....	14, 300	760	3, 110	2, 250, 000	

WHITE RIVER NEAR CHIWAUKUM, WASH.

LOCATION.—In the NE. $\frac{1}{4}$ sec. 5, T. 27 N., R. 16 E., at a highway bridge 4 miles above Wenatchee Lake and 4 miles above Telma.

DRAINAGE AREA.—150 square miles.

RECORDS AVAILABLE.—May 30, 1911, to September 30, 1914; fragmentary.

GAGE.—Vertical staff attached to left abutment of highway bridge.

DISCHARGE MEASUREMENTS.—Made from the highway bridge at the gage or by wading.

CHANNEL AND CONTROL.—Rocks and gravel; shifting in floods.

EXTREMES OF STAGE AND-DISCHARGE.—Maximum stage recorded during year, 6.7 feet at 3.30 p. m. May 15; minimum stage recorded, 0.35 foot September 12-14 and 17.

1911-1914: Maximum stage recorded, 9.0 feet June 13, 1911 (discharge, 3,780 second-feet); minimum stage recorded, -0.34 foot November 1-3, 1911 (discharge, 76 second-feet).

ACCURACY.—Results good.

Discharge measurements of White River near Chiwaukum, Wash., during the year ending Sept. 30, 1914.

[Made by C. O. Brown.]

Date.	Gage height.	Dis- charge.
Aug. 13.....	<i>Fect.</i> 1. 48	<i>Sec.-ft.</i> 523
13.....	1. 42	480

Daily gage height, in feet, of White River near Chiwaukum, Wash., for the year ending Sept. 30, 1914.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1				5.4			16						.45
2				5.75			17						.35
3				5.9			18				3.4		.35
4		4.5		5.1			19	4.1		5.7			.35
5				4.4			20				3.2		.40
6				3.8			21	3.65			2.2		.4
7				3.7			22	3.45		3.1	1.95		.35
8							23	3.25			2.4		.7
9							24				2.3		1.2
10			2.6	3.6			25	2.8					1.1
11				3.8		1.65	26						
12				4.4		1.5	27			3.8	1.9		
13		5.0		4.3	1.45	1.3	28	2.5		3.4			
14		6.4				.95	29			4.15	1.8		.9
15		6.7		3.4		.80	30		3.3	4.8	1.0		
							31				1.9		

CHIWAWA CREEK NEAR LEAVENWORTH, WASH.

LOCATION.—In the SW. $\frac{1}{4}$ sec. 30, T. 27 N., R. 18 E., at Jordan's ranch, $1\frac{1}{4}$ miles below Deep Creek, 3 miles above the mouth, and about 14 miles north of Leavenworth.

DRAINAGE AREA.—181 square miles.

RECORDS AVAILABLE.—May 29, 1911, to May 9, 1912; July 1, 1913, to October 31, 1914, when station was discontinued.

GAGE.—Vertical staff in two sections on left bank.

DISCHARGE MEASUREMENTS.—Made from a cable $2\frac{1}{4}$ miles below the gage, from a bridge one-half mile below the gage, or by wading near the gage.

CHANNEL AND CONTROL.—Rocky; practically permanent.

EXTREMES OF DISCHARGE.—1911-12, 1913-14: Maximum stage recorded, 3.3 feet May 8, 1912 (discharge, 2,410 second-feet); minimum flow estimated at 90 second-feet February 6, 1914, from one discharge measurement, temperature record, observer's notes, and comparison of hydrograph at this station with that of Wenatchee River near Leavenworth, Wash.

WINTER FLOW.—Discharge relation affected by ice.

ACCURACY.—Results good.

Discharge measurements of Chiwawa Creek near Leavenworth, Wash., during the period Oct. 1, 1913, to Oct. 31, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
Feb. 10	F. B. Storey.....	<i>Feet.</i> 0.76	<i>Sec.-ft.</i> 131	Aug. 15	C. O. Brown.....	<i>Feet.</i> 0.68	<i>Sec.-ft.</i> 201
July 11	C. O. Brown.....	1.67	857	Oct. 4	J. T. Hartson.....	.17	118

^a Discharge relation affected by ice.

Daily discharge, in second-feet, of Chiwawa Creek near Leavenworth, Wash., from Oct. 1, 1913, to Oct. 31, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....	240	280	300	193	128	218	368	1,670	1,670	1,360	500	204	221
2.....	240	259	280	193	116	193	368	1,560	2,020	1,360	392	193	218
3.....	221	259	280	193	125	210	453	1,900	2,270	1,360	368	186	210
4.....	221	259	259	193	140	210	538	1,670	1,780	1,360	368	183	193
5.....	221	280	240	259	115	218	624	1,560	1,460	1,170	368	176	186
6.....	221	300	240	344	90	240	728	1,460	1,360	1,040	368	176	183
7.....	221	344	240	500	103	221	802	1,360	1,170	960	344	180	176
8.....	240	300	240	560	128	221	919	1,360	1,040	960	322	176	173
9.....	221	280	237	344	130	221	1,040	1,360	1,000	919	322	176	176
10.....	280	270	233	336	131	250	1,170	1,360	919	919	322	170	190
11.....	300	259	229	328	165	279	1,170	1,360	960	919	322	160	204
12.....	322	240	225	321	155	308	1,170	1,560	1,040	960	322	160	218
13.....	344	240	221	314	165	338	1,360	1,670	1,200	960	300	160	214
14.....	344	240	221	307	180	368	1,360	2,020	1,360	919	300	170	214
15.....	344	344	221	300	190	472	1,460	2,270	1,560	880	322	193	214
16.....	322	530	221	280	193	444	1,560	2,270	1,780	802	300	180	221
17.....	300	444	221	270	193	444	1,560	2,020	2,020	728	280	164	282
18.....	300	368	221	259	193	383	1,560	1,900	2,020	728	270	232	344
19.....	300	368	221	259	193	422	1,560	1,780	1,780	692	259	300	368
20.....	322	344	210	259	193	461	1,560	1,780	1,460	692	240	280	300
21.....	344	300	193	259	196	500	1,360	1,780	1,260	624	240	259	322
22.....	322	300	193	259	204	530	1,360	2,020	1,040	592	240	267	300
23.....	344	300	193	228	196	530	1,560	2,020	919	530	240	275	280
24.....	368	300	193	170	196	530	1,780	2,140	1,040	530	240	283	259
25.....	368	300	193	158	193	530	2,020	1,780	1,040	500	221	291	259
26.....	344	300	193	167	193	530	1,780	1,670	1,040	500	221	300	259
27.....	322	322	193	137	193	500	1,780	1,460	1,040	500	221	322	240
28.....	322	300	193	153	206	500	1,670	1,260	1,090	500	221	240	240
29.....	300	300	193	150	.....	392	1,670	1,170	1,170	472	221	210	240
30.....	300	300	193	146	.....	368	1,670	1,170	1,170	472	221	210	259
31.....	290	.....	193	141	.....	368	.....	1,460	.....	444	210	.....	344

NOTE.—Discharge determined from a rating curve well defined between 80 and 900 second-feet. Discharge estimated because of ice, from observer's notes, climatic records, and one discharge measurement, Jan. 22-31 and Feb. 1-15. Discharge interpolated owing to lack of gage readings, Nov. 10 and Dec. 9-12, 1913; Jan. 10-14 and 17; Mar. 10-13 and 18-20; Apr. 3, 4, 9; May 6; June 13; Aug. 18; Sept. 18 and 22-25, Oct. 10, 11, and 17, 1914.

Monthly discharge of Chiwawa Creek near Leavenworth, Wash., from October, 1913, to October, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
1913-14.					
October.....	368	221	295	18,100	A.
November.....	530	240	308	18,300	A.
December.....	300	193	222	13,600	A.
January.....	560	.....	257	15,800	C.
February.....	206	.....	165	9,160	C.
March.....	530	193	364	22,400	B.
April.....	2,020	368	1,270	75,600	A.
May.....	2,270	1,170	1,670	103,000	A.
June.....	2,270	919	1,360	80,900	A.
July.....	1,360	444	818	50,300	A.
August.....	500	210	293	18,000	A.
September.....	322	160	216	12,900	A.
The year.....	2,270	.....	604	438,000	
1914-15.					
October.....	368	173	242	14,900	A.

ICICLE CREEK NEAR LEAVENWORTH, WASH.

LOCATION.—In sec. 24, T. 24 N., R. 17 E., at Lamb's ranch $1\frac{1}{2}$ miles above the mouth, and $2\frac{1}{2}$ miles south of Leavenworth.

DRAINAGE AREA.—211 square miles.

RECORDS AVAILABLE.—June 9, 1911, to October 31, 1914, when station was discontinued.

GAGE.—Vertical staff nailed to cottonwood tree on left bank.

DISCHARGE MEASUREMENTS.—Made from cable near gage or by wading.

CHANNEL AND CONTROL.—Heavy sand and coarse gravel; control fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.2 feet at 5 p. m. May 15, and 6 p. m. June 2 (discharge, 2,890 second-feet); minimum stage recorded, 0.25 foot September 11–14 (discharge, 110 second-feet).

1911–1914: Maximum stage recorded, 8.1 feet at 8 a. m. June 3, 1913 (discharge, 4,760 second-feet); minimum stage recorded, 0.18 foot November 2–3, 1911 (discharge, 84 second-feet).

DIVERSIONS.—Several small diversions above the station.

ACCURACY.—Results excellent except during winter.

COOPERATION.—Gage-height record furnished by the Wenatchee Valley Gas & Electric Co. to June 30, 1913.

Discharge measurements of Icicle Creek near Leavenworth, Wash., during the year ending Sept. 30, 1914.

[Made by C. O. BROWN.]

Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>
July 10.....	1.69	872
10.....	1.68	841
Sept. 23.....	.41	178

Daily discharge, in second-feet, of Icicle Creek near Leavenworth, Wash., from Oct. 1, 1913, to Oct. 31, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....	176	296	345	176	272	248	395	1,110,	2,350	1,330	320	130	200
2.....	176	296	320	186	272	234	395	1,030	2,890	1,330	345	130	214
3.....	167	272	296	214	272	224	395	2,050	2,470	1,220	320	130	214
4.....	153	272	262	476	272	224	495	1,630	1,810	1,220	296	130	200
5.....	153	272	272	738	248	224	645	1,450	1,330	1,000	296	122	200
6.....	176	296	296	1,000	200	224	670	1,330	1,160	890	296	122	176
7.....	176	272	296	1,160	214	224	725	1,330	1,000	890	272	122	176
8.....	176	262	272	835	170	248	835	1,330	890	890	272	130	153
9.....	176	272	248	645	140	248	890	1,280	780	835	258	122	130
10.....	200	272	248	570	180	248	1,000	1,330	780	780	248	122	224
11.....	670	258	248	520	190	248	1,000	1,330	780	780	248	110	248
12.....	570	224	248	470	200	262	1,000	1,570	1,060	890	258	110	248
13.....	670	195	248	470	190	296	1,110	1,930	1,450	835	238	110	296
14.....	520	219	248	445	190	370	1,160	2,590	1,570	780	238	110	320
15.....	445	296	224	420	176	370	1,450	2,890	2,050	780	224	176	272
16.....	395	1,000	224	420	176	420	1,220	2,530	2,290	670	224	176	272
17.....	370	835	224	370	153	470	1,060	2,170	2,290	620	210	176	420
18.....	370	495	234	370	176	520	1,000	2,050	2,050	595	200	224	420
19.....	445	445	214	320	176	545	1,810	2,050	1,690	620	200	296	470
20.....	470	395	186	320	176	570	1,570	2,170	1,330	570	200	224	420
21.....	470	395	186	320	200	595	1,280	2,350	1,110	520	200	224	370
22.....	420	370	186	340	200	620	1,110	2,350	945	445	186	200	345
23.....	420	370	200	282	200	620	1,060	2,590	835	445	176	176	320
24.....	570	495	186	258	214	595	1,000	2,410	1,220	420	176	176	320
25.....	495	445	186	272	224	545	945	2,050	1,110	420	176	176	296
26.....	420	420	186	286	210	520	945	1,630	1,000	395	176	272	296
27.....	370	420	176	258	320	495	890	1,450	1,000	395	167	296	296
28.....	370	395	176	224	272	470	835	1,220	1,000	345	153	248	296
29.....	345	395	176	210	.....	445	780	1,160	1,110	345	153	224	296
30.....	320	370	176	282	.....	420	835	1,220	1,220	320	153	214	420
31.....	296	.....	176	272	.....	395	.....	1,810	.....	320	130	.....	445

NOTE.—Discharge determined from a rating curve well defined above 100 second-feet. Discharge estimated, because of ice, from observer's notes and climatic records, Jan. 4, 5, 22, and 30, and Feb. 6–13.

Monthly discharge of Icicle Creek near Leavenworth, Wash., from October, 1913, to October 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
1914.					
October.....	670	153	360	22,100	A.
November.....	1,000	195	374	22,300	A.
December.....	345	176	231	14,200	A.
January.....	1,160	176	424	26,100	C.
February.....	320	140	210	11,700	C.
March.....	620	224	392	24,100	A.
April.....	1,810	395	950	56,500	A.
May.....	2,890	1,110	1,820	112,000	A.
June.....	2,890	780	1,420	84,500	A.
July.....	1,330	320	706	43,400	A.
August.....	345	130	226	13,900	A.
September.....	296	110	173	10,300	A.
The year.....	2,890	110	609	441,000	
1915.					
October.....	470	130	289	17,800	A.

WENATCHEE VALLEY CANAL AT DRYDEN, WASH.

LOCATION.—In sec. 26, T. 24 N., R. 18 E., one-fourth mile below the Dryden power house; one-half mile below Dryden, $1\frac{1}{2}$ miles below the canal intake, and $3\frac{1}{2}$ miles above Cashmere.

RECORDS AVAILABLE.—June 1, 1911, to September 30, 1914, irrigation seasons only.

GAGE.—Vertical staff on left side of flume.

DISCHARGE MEASUREMENTS.—Made from plank laid across flume.

CHANNEL AND CONTROL.—Rectangular timber flume.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3 feet August 26 to September 11 (discharge, 122 second-feet); minimum stage recorded, 0.80 foot from 8 a. m. April 5, when water was turned into canal, to 6 a. m. April 7 (discharge, 12.6 second-feet); from November 7 to April 4 canal was diverting no water.

1911-1914: Maximum stage recorded, 3.05 feet August 27-28, 1913 (discharge, 126 second-feet); canal diverts no water during nonirrigating season.

ACCURACY.—Results good.

COOPERATION.—Gage-height record furnished by the Wenatchee Valley Gas & Electric Co.

Discharge measurements of Wenatchee Valley canal at Dryden, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
July 6	Brown and Burroughs	2.78	106
Aug. 6	Burroughs and Williams	2.83	116
Sept. 22	C. O. Brown	1.90	53.8

Daily discharge, in second-feet, of Wenatchee Valley canal at Dryden, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	88	59	.....	70	101	104	108	122
2.....	88	59	.....	70	101	104	108	122
3.....	88	59	.....	70	101	104	108	122
4.....	88	59	.....	70	101	104	108	122
5.....	88	59	8.4	72	101	104	108	122
6.....	88	44	12.6	76	101	104	108	122
7.....	88	.....	16.6	76	101	104	108	122
8.....	88	.....	21	76	101	104	108	122
9.....	88	.....	24	76	101	104	108	122
10.....	88	.....	28	76	101	104	108	122
11.....	72	.....	28	78	101	104	108	122
12.....	59	.....	28	82	101	104	112	112
13.....	59	.....	31	82	101	104	112	101
14.....	59	.....	35	85	101	104	112	101
15.....	59	.....	35	85	101	104	112	101
16.....	59	.....	35	88	101	104	112	101
17.....	59	.....	35	88	101	104	112	94
18.....	59	.....	39	91	101	104	112	82
19.....	59	.....	44	94	101	104	115	76
20.....	59	.....	44	94	101	104	115	67
21.....	59	.....	44	98	101	104	115	59
22.....	59	.....	44	98	101	104	115	54
23.....	59	.....	51	98	101	104	115	54
24.....	59	.....	51	98	101	104	115	54
25.....	59	.....	51	98	101	104	118	54
26.....	59	.....	51	101	101	104	122	54
27.....	59	.....	56	101	101	104	122	54
28.....	59	.....	61	101	101	104	122	54
29.....	59	.....	64	101	101	108	122	54
30.....	59	.....	67	101	101	108	122	48
31.....	59	.....	.....	101	.....	108	122	.....

NOTE.—Discharge determined from a rating curve well defined between 18 and 140 second-feet. Canal dry 5.50 p. m. Nov. 6, 1913, to 8 a. m. April 5, 1914.

Monthly discharge of Wenatchee Valley canal at Dryden, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	88	59	68.8	4,230	B.
November 1-6.....	59	44	56.5	672	B.
April 5-30.....	67	8.4	38.6	1,990	A.
May.....	101	70	86.9	5,340	A.
June.....	101	101	101	6,010	A.
July.....	108	104	104	6,400	A.
August.....	122	108	113	6,950	A.
September.....	122	48	90.5	5,390	A.

MOSES LAKE AT NEPPEL, WASH.¹

LOCATION.—On line between secs. 14 and 15, T. 19 N., R. 28 E., at the highway bridge across Parker Horn, at Nepel, in Grant County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 23 to December 12, 1909; April 3, 1910, to September 30, 1914.

¹ Records formerly published as "Moses Lake near Moses Lake, Wash."

GAGE.—Since October 17, 1912, vertical staff attached to west side of south pier of highway bridge across Parker Horn. Zero of gage at elevation 1,000 feet above mean sea level. Gage read to hundredths at irregular intervals during year ending September 30, 1914, by H. M. Flemming October 1 to March 31, and by W. R. Hill, May 17 to September 30. From March 22, 1911, to October 16, 1912, a vertical staff gage at same site but with zero of gage at elevation 1,036.79 feet above mean sea level. Gage heights January 1 to October 16, 1912, corrected to give heights above elevation 1,000 feet mean sea level. From June 23 to December 12, 1909, vertical staff on east shore of Moses Lake, 2½ miles southwest of present gage; near center of sec. 28, T. 19 N., R. 28 E. Willamette meridian. This gage was carried out by ice in December, 1909, and since it was not referenced to a bench mark the readings can not be reduced to present datum. From April 3, 1910, to March 21, 1911, a combined vertical and inclined staff gage on the east shore of Moses Lake near original location with zero of gage at elevation 1,036.79 feet, mean sea level.

CONTROL.—Dam at lake outlet, with crest elevation of 1,046.00 feet and a spillway width of 75 feet.

EXTREMES OF STAGE.—Maximum stage recorded during year, 46.54 feet March 13; minimum stage recorded, 45.76 feet September 14 and 16.

1910-1914: Maximum stage recorded, 47.17 feet at 8 a. m. March 27, 1913; minimum stage recorded, 38.17 feet August 27, 1910.

WINTER FLOW.—Lake freezes over each year.

DIVERSIONS.—Considerable water is pumped from the lake and from wells to the lake for use in irrigation.

REGULATION.—None.

ACCURACY.—Gage-height record apparently excellent.

Daily gage height, in feet, of Moses Lake at Neppel, Wash., for the year ending Sept. 30, 1914.

[W. R. Hill, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	45.93									46.10	45.93	
2.				46.33						46.10		45.79
3.		46.12									45.93	
4.						46.32			46.10	46.09	45.93	
5.						46.34					45.93	45.78
6.		46.19		46.37		46.40			46.10	46.08		
7.	45.98		46.27			46.46			46.10			
8.											45.90	
9.						46.52			46.11			45.77
10.	46.00				46.29	46.52				46.07		
11.						46.52			46.11			
12.												
13.		46.20		46.35		46.54			46.13	46.06	45.88	
14.					46.29							45.76
15.			46.26			46.52			46.14		45.88	
16.										46.02		45.76
17.		46.26			46.28	46.51		46.20	46.14		45.86	
18.												
19.				46.33						46.00	45.84	
20.				46.35		46.48			46.10			
21.									46.10	45.98		45.79
22.				46.37	46.32							
23.	46.10	46.28						46.15		45.98	45.83	45.81
24.	46.11				46.33			46.14	46.04			
25.		46.27						46.13	46.10	45.98		
26.				46.36	46.31					45.97	45.81	
27.					46.30				46.10			45.88
28.					46.30	46.42		46.12				
29.				46.34						45.94	45.81	
30.								46.12	46.10			45.89
31.			46.36	46.31		46.42		46.12		45.93		

KEECHELUS LAKE NEAR MARTIN, WASH.

LOCATION.—Just above outlet to lake, $3\frac{1}{2}$ miles northwest of Martin station on the Northern Pacific Railway, and $9\frac{1}{2}$ miles northwest of Easton.

DRAINAGE AREA.—55 square miles.

RECORDS AVAILABLE.—January 12, 1906, to September 30, 1914.

GAGE.—Vertical staff in 3 sections used until beginning of construction of new dam.

Several changes in location have been necessary during the construction, but all readings have been reduced to same datum. Gage heights indicate height of water surface above sill of outlet tunnels in the dam, which is at elevation 2,457 feet above sea-level.

EXTREMES OF STAGE.—Maximum stage recorded during year, 12.35 feet at 4.30 p. m. May 3; minimum stage recorded, -2.11 feet September 30.

1906-1914: Maximum stage recorded, 14.38 feet November 23, 1909; minimum stage recorded, -2.11 feet, September 30, 1914.

STORAGE.—Storage in the lake is controlled by the operation of gates in the dam at the outlet. A new channel was cut through the old dam on August 19, 1914, making available 41,800 acre-feet additional storage. The record of the amount stored or released each month is used in connection with the records of the gaging station below the dam.

COOPERATION.—Complete record furnished by United States Reclamation Service.

Daily capacity, in acre-feet, of Keechelus Lake near Martin, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	14,620	8,740	13,435	11,500	12,625	12,655	8,231	17,230	12,190	6,926	1,610	40,259
2.....	14,170	8,520	13,420	11,470	12,580	12,760	7,506	17,640	12,910	6,781	1,330	40,218
3.....	13,525	8,230	13,345	11,470	12,445	12,790	6,955	18,012	13,375	6,636	1,050	40,191
4.....	12,880	8,055	13,270	11,590	12,565	12,850	6,665	17,841	13,465	6,491	868	40,163
5.....	12,310	7,970	13,120	12,550	12,430	12,790	6,781	17,500	13,555	6,317	868	40,136
6.....	11,860	8,290	13,000	14,440	12,340	12,700	6,926	17,320	14,170	6,027	812	40,136
7.....	11,380	8,375	12,970	16,480	12,220	12,700	7,158	17,230	14,770	5,766	812	40,054
8.....	10,870	8,275	12,850	16,915	12,100	12,625	7,477	17,020	15,445	5,534	812	40,040
9.....	10,540	8,230	12,715	16,600	12,010	12,550	8,405	16,930	16,075	5,288	854	40,013
10.....	10,390	8,085	12,640	16,240	11,935	12,565	9,623	16,690	16,450	5,070	910	39,944
11.....	11,350	8,330	12,635	15,850	11,905	12,550	10,735	16,600	16,690	4,896	910	39,917
12.....	12,520	7,825	12,430	15,460	11,845	12,550	11,800	16,630	16,615	4,794	840	39,862
13.....	13,090	7,535	12,355	15,115	11,800	12,610	12,865	16,705	16,375	4,664	770	39,752
14.....	13,390	7,100	12,280	14,800	11,740	13,150	13,600	16,930	16,090	4,519	742	39,698
15.....	13,315	6,780	12,250	14,455	11,650	14,110	14,635	17,095	15,910	4,403	672	39,821
16.....	13,080	7,520	12,160	14,200	11,605	14,620	15,190	16,975	15,370	4,316	532	39,766
17.....	12,640	8,680	12,115	13,960	11,530	14,710	14,815	16,690	14,830	4,200	420	39,739
18.....	12,310	9,535	12,070	13,750	11,500	14,770	14,275	16,480	14,095	4,172	266	39,794
19.....	12,040	10,225	11,950	13,555	11,470	14,875	13,930	16,210	13,300	4,088	41,804	39,835
20.....	11,860	10,750	11,920	13,315	11,410	14,890	14,260	16,090	12,415	4,004	41,749	39,821
21.....	11,575	11,200	11,830	13,195	11,440	14,920	15,490	16,000	11,620	3,962	41,624	39,903
22.....	11,320	11,575	11,830	13,315	11,530	14,830	16,450	16,000	10,840	4,088	41,445	39,999
23.....	11,020	11,860	11,740	13,165	11,620	14,680	16,930	15,970	10,000	4,144	41,238	39,999
24.....	10,810	12,280	11,665	13,000	11,770	14,560	17,065	15,565	9,492	4,214	41,072	39,958
25.....	10,630	12,550	11,620	12,895	11,770	14,140	17,080	15,100	8,912	4,287	40,948	39,889
26.....	10,420	12,790	11,590	12,865	11,800	13,420	17,110	14,500	8,478	4,403	40,796	39,780
27.....	10,180	13,000	11,590	12,790	12,040	12,640	17,230	13,750	8,057	4,403	40,658	39,451
28.....	9,700	13,165	11,605	12,640	12,385	11,740	17,170	12,940	7,709	3,892	40,520	39,259
29.....	9,650	13,270	11,560	12,580	.....	10,840	17,080	12,100	7,419	3,388	40,410	39,040
30.....	9,290	13,405	11,500	12,610	.....	9,985	17,080	11,350	7,172	2,730	40,343	38,889
31.....	9,000	.....	11,500	12,610	.....	9,101	.....	11,515	.....	2,100	40,328	.....

YAKIMA RIVER NEAR MARTIN, WASH.

LOCATION.—1,000 feet below present dam at outlet of Lake Keechelus, 200 feet downstream from cut-off channel, $3\frac{1}{2}$ miles northwest of Martin station on the Northern Pacific Railway, $1\frac{1}{2}$ miles east of Meadow Creek station on Chicago, Milwaukee & St. Paul Railway, and $9\frac{1}{2}$ miles northwest of Easton.

DRAINAGE AREA.—55 square miles.

RECORDS AVAILABLE.—October 18 to November 14, 1903; January 28, 1904, to September 30, 1914.

GAGE.—Vertical staff attached to bent of bridge at construction camp installed October 7, 1912. Previous gage was at approximately same location.

DISCHARGE MEASUREMENTS.—Made from cable 200 feet below the gage, or by wading. CHANNEL AND CONTROL.—Gravel; shifts slightly in floods; logs sometimes lodge on riffle control below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.62 feet at 7.30 a. m. May 15 (discharge, 1,660 second-feet); minimum stage recorded, 5.79 feet at 8 a. m. and 4.30 p. m. November 16 (discharge, 16 second-feet).

1904-1914: Maximum stage recorded, 14.25 feet at 9 a. m. November 15, 1906 (discharge, 6,500 second-feet). Flow has been regulated since the fall of 1906. Gates in timber-crib dam above the gaging station have been closed frequently, resulting in practically no flow past the gage.

WINTER FLOW.—Ice does not form at this station.

REGULATION.—Flow partly controlled by storage and release of water at Keechelus Lake reservoir computations of monthly discharge corrected for the effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River near Martin, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
Nov. 29	G. L. Parker.....	<i>Feet.</i> 7.19	<i>Sec.-ft.</i> 240	July 27	Moxley and Blooms- burg.....	<i>Feet.</i> 7.66	<i>Sec.-ft.</i> 368
May 19	F. E. Moxley.....	8.59	335	Aug. 18	W. Bloomsburg.....	7.04	152
Jun. 13	.....do.....	6.85	153	Sept. 9	F. E. Moxley.....	1.13	81.5

Daily discharge, in second-feet, of Yakima River near Martin, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	266	266	251	118	185	185	668	560	374	357	228	76
2.....	374	236	251	114	181	197	725	975	461	321	167	72
3.....	395	223	236	111	177	209	696	1,320	534	304	136	88
4.....	374	209	236	121	183	209	640	1,320	534	288	104	74
5.....	299	209	223	185	181	197	586	975	197	272	88	81
6.....	335	236	209	374	172	197	509	784	45	257	87	76
7.....	374	236	209	784	164	185	438	846	46	272	68	90
8.....	317	223	197	1,040	162	185	162	846	46	257	47	84
9.....	282	317	185	815	156	185	24	754	87	242	52	90
10.....	266	133	183	668	144	185	25	910	185	228	71	84
11.....	374	485	181	560	140	185	32	846	266	214	71	88
12.....	485	461	172	509	140	185	90	975	560	201	76	73
13.....	535	416	164	461	136	77	354	1,110	354	191	68	81
14.....	560	374	164	416	127	21	696	1,320	754	186	68	82
15.....	560	116	162	374	125	22	846	1,560	846	176	58	101
16.....	535	16	156	335	123	485	1,040	1,320	1,040	147	98	101
17.....	485	17	150	299	120	509	1,180	1,110	1,040	147	142	102
18.....	461	19	148	282	120	509	1,110	975	1,110	132	142	103
19.....	438	40	146	266	114	534	1,110	910	950	130	149	93
20.....	438	68	144	236	111	534	299	910	867	121	122	95
21.....	461	93	136	236	111	534	23	975	806	54	142	96
22.....	416	116	136	236	121	534	144	1,040	747	56	113	70
23.....	395	136	133	236	123	509	354	1,110	662	62	122	78
24.....	374	162	125	222	129	560	461	1,110	635	45	113	112
25.....	374	181	121	209	134	696	485	1,250	582	36	122	138
26.....	335	197	121	209	134	754	485	1,180	507	37	110	148
27.....	317	209	121	197	156	754	586	1,110	438	145	117	202
28.....	299	236	121	185	170	754	560	1,040	417	339	117	160
29.....	317	236	118	185	.....	725	485	975	376	357	104	186
30.....	317	251	112	185	.....	696	461	910	357	357	93	184
31.....	282	.....	118	185	.....	725	.....	317	.....	321	84	.....

NOTE.—Discharge determined from rating curves as follows: Oct. 1 to June 18, well defined above 100 second-feet; June 19 to Sept. 11, fairly well defined; Sept. 12-30, well defined between 70 and 1,000 second-feet.

Monthly discharge of Yakima River near Martin, Wash., for year ending Sept. 30, 1914.

[Drainage area, 55 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge with- out storage (second-feet).		Run-off (depth in inches on drainage area).	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored.	With- out storage.	Mean.	Per square mile.		
October.....	560	266	388	23,900	-6,070	17,800	290	5.27	6.08	A.
November.....	485	16	204	12,100	+4,400	16,500	277	5.04	5.62	A.
December.....	251	112	165	10,100	-1,900	8,200	133	2.42	2.79	A.
January.....	1,040	111	334	20,500	+1,110	21,600	351	6.38	7.36	A.
February.....	185	111	144	8,010	-225	7,780	140	2.55	2.66	A.
March.....	754	21	395	24,300	-3,280	21,000	342	6.22	7.17	A.
April.....	1,180	23	509	30,300	+7,980	38,300	644	11.7	13.05	A.
May.....	1,560	317	1,010	62,100	-5,560	56,500	919	16.7	19.25	A.
June.....	1,110	45	527	31,300	-4,340	27,000	454	8.25	9.20	A.
July.....	357	36	202	12,400	-5,070	7,330	119	2.16	2.49	B.
August.....	228	47	106	6,500	-3,560	2,940	47.8	.869	1.00	B.
September.....	202	70	104	6,160	-1,440	4,720	79.3	1.44	1.61	B.
The year.	1,560	16	342	248,000	-18,000	230,000	318	5.78	78.28	

YAKIMA RIVER AT EASTON, WASH.

LOCATION.—In sec. 11, T. 20 N., R. 13 E., at the highway bridge on the State road leading from Easton to Lake Keechelus, about one-fourth mile northwest of Easton and $1\frac{1}{2}$ miles below mouth of Kachess River.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—May 12 to November 28, 1904; February 5, 1910, to September 30, 1914.

GAGE.—October 1, 1913, to July 27, 1914, chain gage which had been used since June 20, 1910; after July 27, 1914, vertical staff anchored to left downstream caisson of bridge, at datum 0.98 foot lower than chain gage. Gage used in 1904 was a vertical staff nailed to a stump on left bank 20 feet below bridge at datum different from that of chain gage. Gage installed February 5, 1910, was a vertical staff nailed to center pile on right approach to bridge, at same datum as chain gage.

DISCHARGE MEASUREMENTS.—Made from the bridge or by wading.

CHANNEL AND CONTROL.—Gravel; shifts at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.41 feet at 6 p. m. May 16 (discharge, 2,570 second-feet); minimum stage recorded, 1.59 feet at 3 p. m. January 3 (discharge, 233 second-feet).

1904, 1910-1914: Maximum stage recorded, 6.1 feet November 19, 1911 (discharge, 5,900 second-feet); minimum flow estimated at 25 second-feet September 22, 1913, when outlet gates of Keechelus and Kachess reservoirs were closed.

WINTER FLOW.—Ice does not form at this station.

REGULATION.—Flow partly regulated by the storage and release of water at Keechelus and Kachess Lake reservoirs; discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River at Easton, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 18	Reed and Moxley	2.57	1,510	May 18	F. E. Moxley	3.85	1,960
Nov. 28	Taylor and Parker	1.48	873	June 12	do.	2.93	1,070
Apr. 14	F. E. Moxley	3.08	1,050	July 29	Bloomsburg and Moxley	2.41	718
May 9	do.	3.02	1,110	Aug. 18	W. Bloomsburg	2.88	1,080
May 16	Paul Taylor	4.33	2,420	Sept. 9	F. E. Moxley	1.64	277

Daily discharge, in second-feet, of Yakima River at Easton, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	993	574	680	305	450	405	742	774	1,110	809	739	990
2.....	918	453	650	264	427	378	680	1,310	1,230	774	705	990
3.....	1,150	549	650	233	400	387	650	1,770	1,310	638	705	990
4.....	1,350	601	622	284	495	364	595	1,670	1,270	638	705	990
5.....	1,350	574	595	472	378	364	650	1,270	739	638	953	953
6.....	1,430	685	595	775	378	364	710	1,230	672	573	953	739
7.....	1,430	685	595	1,020	427	343	710	1,200	292	573	953	739
8.....	1,190	549	570	1,450	400	343	1,290	1,170	605	573	990	542
9.....	1,350	628	495	1,290	378	292	1,090	1,150	542	573	990	423
10.....	1,430	715	545	1,050	378	364	1,130	1,110	605	573	990	450
11.....	1,520	499	495	910	378	364	1,130	1,230	672	573	990	450
12.....	1,520	810	495	807	378	356	1,050	1,270	1,110	638	990	423
13.....	1,610	745	495	775	334	364	980	1,480	1,110	573	990	739
14.....	1,610	715	495	742	356	292	910	1,670	1,190	376	990	774
15.....	1,430	601	495	710	334	321	1,210	1,880	1,270	328	990	774
16.....	1,520	499	495	680	334	980	1,370	2,560	1,270	573	990	774
17.....	1,430	413	495	623	334	980	1,290	2,320	1,310	638	990	774
18.....	1,520	353	448	427	334	1,020	1,210	1,770	1,310	638	1,030	774
19.....	1,190	268	426	427	356	1,020	1,370	1,880	953	573	1,070	774
20.....	1,070	283	448	427	334	980	1,370	1,880	953	450	1,070	739
21.....	1,270	268	426	427	369	775	1,210	1,880	880	401	1,070	672
22.....	1,070	300	426	520	400	910	705	1,990	844	510	1,070	638
23.....	918	317	405	472	378	910	809	1,990	705	573	1,070	638
24.....	1,110	335	397	495	427	910	844	2,100	705	605	1,030	573
25.....	1,150	549	393	495	427	840	915	1,990	605	705	1,030	573
26.....	1,070	574	346	472	405	875	915	1,880	605	605	1,030	573
27.....	1,070	685	328	427	495	875	880	1,670	844	450	1,030	638
28.....	745	685	328	427	392	875	844	1,770	880	739	990	705
29.....	657	595	328	472	.....	840	739	1,670	844	774	423	638
30.....	745	680	321	472	.....	840	774	1,570	844	739	423	638
31.....	715	.....	328	472	.....	775	.....	774	.....	739	573	.....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 28, from a well-defined rating curve and by daily comparison with the sum of the discharges of Yakima River near Martin, Kachess River near Easton, and Cabin Creek at Easton; Nov. 29 to Apr. 21, and Apr. 22 to Sept. 30, from two well-defined rating curves. Discharge interpolated, owing to lack of gage readings, May 7 and 8.

Monthly discharge of Yakima River at Easton, Wash., for year ending Sept. 30, 1914.

[Drainage area, 184 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drain- age area).	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored. ^a	Without storage.	Mean.	Per square mile.		
October.....	1,610	657	1,210	74,400	-43,100	31,300	509	2.77	3.19	A.
November.....	810	268	540	32,100	+ 4,700	36,800	618	3.36	3.75	A.
December.....	680	321	478	29,400	- 7,800	21,600	351	1.91	2.20	A.
January.....	1,450	233	607	37,300	+10,200	47,500	773	4.20	4.84	A.
February.....	495	334	388	21,600	- 3,220	18,400	331	1.80	1.87	A.
March.....	1,020	292	636	39,100	+16,500	55,600	904	4.91	5.66	A.
April.....	1,370	595	959	57,000	+30,400	87,400	1,470	7.99	8.91	A.
May.....	2,560	774	1,610	99,000	+14,600	114,000	1,850	10.1	11.64	A.
June.....	1,310	292	909	54,100	+ 1,960	56,100	943	5.12	5.71	A.
July.....	809	328	599	36,800	-20,500	16,300	265	1.44	1.66	A.
August.....	1,070	423	920	56,600	-49,700	6,900	112	.609	.70	A.
September.....	990	423	703	41,800	-34,200	7,600	128	.696	.78	A.
The year..	2,560	233	800	579,000	-80,200	500,000	690	3.75	50.91	

^a Combined storage of Keechelus and Kachess reservoirs.

YAKIMA RIVER AT CLE ELUM, WASH.

LOCATION.—In sec. 27, T. 20 N., R. 15 E., at the highway bridge at Cle Elum just above Roslyn Creek, 5 miles above the mouth of Teanaway River, and 3 miles below the mouth of Cle Elum River.

DRAINAGE AREA.—500 square miles.

RECORDS AVAILABLE.—August 27, 1906, to September 30, 1914.

GAGE.—Friez water-stage recorder installed July 12, 1911. Chain gage attached to upstream handrail of the bridge was used until August 12, 1910, when an inclined staff was set 30 feet below the bridge on the right bank of the river. Datum of automatic gage same as that of staff gage.

DISCHARGE MEASUREMENTS.—Made from the highway bridge.

CHANNEL AND CONTROL.—Gravel and cobblestones; permanent except at highest stages. Current is smooth; velocities moderate.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.22 feet at 2 a. m. May 17 (discharge, 6,850 second-feet); minimum stage, 1.71 feet at 2 a. m. November 20 (discharge, 419 second-feet).

1906-1914: Maximum stage recorded, 12.5 feet during afternoon of November 14, 1915, estimated from high-water marks (discharge, approximately, 25,600 second-feet); minimum stage recorded, 1.11 feet September 30, 1911 (discharge, 196 second-feet).

WINTER FLOW.—Discharge relation little affected by ice which exists for short periods only.

REGULATION.—Flow partly regulated by storage and release of water at Keechelus, Kachess, and Cle Elum reservoirs. Discharge data corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River at Cle Elum, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 1	R. K. Ray.....	2.94	1,219	May 20	F. E. Moxley.....	5.42	4,850
17	Reed and Moxley.....	3.91	2,279	June 11	do.....	3.50	1,710
Nov. 25	Taylor and Parker.....	2.02	601	July 30	Moxley and Bloomsburg	3.10	1,310
Apr. 15	F. E. Moxley.....	5.23	4,220	Aug. 19	W. Bloomsburg.....	3.39	1,600
May 16	Paul Taylor.....	6.16	6,410				

Daily discharge, in second-feet, of Yakima River at Cle Elum, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	1,220	1,350	1,550	670	1,130	790	2,090	2,980	3,350	2,090	1,350	1,400
2.....	1,300	1,090	1,550	670	1,090	778	2,020	3,530	4,100	2,160	1,300	1,400
3.....	1,400	1,130	1,550	659	1,050	760	1,960	4,950	4,310	2,230	1,260	1,450
4.....	1,450	1,130	1,550	637	1,090	766	1,960	5,720	4,420	2,230	1,260	1,350
5.....	1,660	1,130	1,550	797	1,050	760	2,090	5,060	3,710	2,090	1,220	1,300
6.....	1,660	1,220	1,550	1,170	970	730	2,230	4,310	2,820	2,020	1,500	1,050
7.....	1,770	1,220	1,550	1,720	970	718	2,230	4,000	2,450	1,890	1,550	1,010
8.....	1,720	1,170	1,550	2,520	895	760	2,380	4,000	2,160	1,720	1,550	970
9.....	1,660	1,170	1,500	2,450	895	797	3,120	3,710	1,960	1,660	1,600	760
10.....	1,600	1,260	1,500	2,300	853	797	3,710	3,800	1,720	1,600	1,600	700
11.....	1,770	1,090	1,450	2,020	825	790	3,800	3,800	1,770	1,550	1,600	700
12.....	2,020	1,260	1,450	1,960	811	784	4,000	4,100	2,020	1,660	1,600	670
13.....	2,230	1,300	1,450	1,890	790	804	4,100	4,620	2,450	1,720	1,660	895
14.....	2,380	1,170	1,400	1,830	784	860	4,100	5,500	2,600	1,720	1,660	930
15.....	2,450	930	1,350	1,770	772	1,050	4,520	6,300	3,050	1,350	1,600	970
16.....	2,450	700	1,260	1,720	760	1,400	4,840	6,550	3,530	1,350	1,600	1,050
17.....	2,380	706	1,220	1,660	742	1,960	4,730	6,800	3,800	1,550	1,660	1,050
18.....	2,300	694	1,170	1,600	730	2,300	4,200	5,840	3,900	1,550	1,720	1,050
19.....	2,230	470	1,220	1,500	718	2,680	4,200	5,280	3,710	1,450	1,660	1,050
20.....	2,020	428	1,090	1,450	712	2,750	5,060	5,060	3,200	1,450	1,550	1,010
21.....	2,020	433	1,050	1,450	724	2,750	4,950	5,280	2,900	1,400	1,550	970
22.....	2,020	460	970	1,450	615	2,820	4,310	5,390	2,600	1,350	1,550	970
23.....	1,960	495	895	1,400	643	2,820	3,350	5,610	2,300	1,350	1,550	970
24.....	1,960	520	895	1,350	665	2,750	3,200	5,720	2,160	1,350	1,550	930
25.....	1,960	571	853	1,300	670	2,820	3,050	5,500	2,230	1,400	1,550	930
26.....	1,960	778	825	1,260	670	2,820	2,900	4,950	2,020	1,400	1,550	970
27.....	1,890	970	754	1,220	804	2,680	3,050	4,520	1,890	1,450	1,500	832
28.....	1,830	1,260	724	1,170	930	2,520	2,980	4,100	2,020	1,260	1,500	736
29.....	1,500	1,500	700	1,170	.....	2,380	2,820	3,710	2,020	1,300	1,450	730
30.....	1,450	1,660	688	1,130	.....	2,230	2,900	3,440	2,020	1,350	895	760
31.....	1,400	.....	676	1,130	.....	2,230	.....	3,200	.....	1,350	895	.....

NOTE.—Discharge determined from well-defined rating curve.

Monthly discharge of Yakima River at Cle Elum, Wash., for year ending Sept. 30, 1914.

[Drainage area, 500 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge with out storage (second-feet).		Run-off (depth in inches on drain- age area).	Accu- racy of ob- serv- ed flow.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored. ^a	Without storage.	Mean.	Per square mile.		
October.....	2,450	1,220	1,860	114,000	-40,100	73,900	1,200	2.40	2.77	A.
November.....	1,660	428	976	58,000	+22,100	80,100	1,360	2.72	3.04	A.
December.....	1,550	676	1,210	74,400	-27,100	47,300	769	1.54	1.78	A.
January.....	2,520	637	1,450	89,300	+12,200	102,000	1,660	3.32	3.83	A.
February.....	1,130	615	834	46,300	- 2,040	44,300	798	1.60	1.67	A.
March.....	2,820	718	1,670	103,000	+28,100	131,000	2,130	4.26	4.91	A.
April.....	5,060	1,960	3,360	200,000	+34,900	235,000	3,950	7.90	8.81	A.
May.....	6,800	2,980	4,750	292,000	+16,500	308,000	5,010	10.0	11.53	A.
June.....	4,420	1,720	2,770	165,000	+ 1,020	166,000	2,790	5.58	6.23	A.
July.....	2,230	1,260	1,610	99,200	-25,900	73,300	1,190	2.38	2.74	A.
August.....	1,720	895	1,480	91,300	-64,900	26,400	429	.858	.99	A.
September.....	1,450	670	985	58,600	-32,000	26,600	447	.894	1.00	A.
The year	6,800	428	1,920	1,390,000	-77,200	1,310,000	1,810	3.62	49.30	

^a Combined storage of Keechelus, Kachess, and Cle Elum reservoirs.

YAKIMA RIVER AT UMTANUM, WASH.

LOCATION.—In sec. 20, T. 16 N., R. 19 E. unsurveyed, at Umtanum, one-half mile above Umtanum Creek, and 13 miles south of Ellensburg.

DRAINAGE AREA.—1,620 square miles.

RECORDS AVAILABLE.—August 25, 1906, to May 20, 1907; August 10, 1907, to September 30, 1914.

GAGE.—Since July 10, 1914, Stevens water-stage recorder referred to staff gage at same site as Barrett & Lawrence water-stage recorder installed September 28, 1911, and referred to chain gage on right bank used June 26, 1908, to July 10, 1914. Original gage was a vertical staff in four sections. Gage datum was lowered 0.13 foot January 1, 1911.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet above gage.

CHANNEL AND CONTROL.—Rocks and gravel; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.87 feet at 6 p. m. May 16 (discharge, 7,740 second-feet); minimum stage recorded, 3.60 feet at 7 a. m. October 1 (discharge, 535 second-feet).

1906-1914: Maximum stage recorded, 14.2 feet November 16, 1906, estimated from high-water marks (discharge, approximately, 41,000 second-feet); minimum stage recorded, 2.95 feet August 31, 1906 (discharge, 290 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Station is below all return waters from irrigation in Kittitas Valley.

REGULATION.—Flow affected by storage in Keechelus, Kachess, and Cle Elum lakes.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River at Umtanum, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 18	F. E. Moxley.....	4.96	2,460	May 23	F. E. Moxley.....	6.41	6,250
Nov. 30	G. L. Parker.....	4.64	1,930	June 17	Paul Taylor.....	5.47	3,520
Apr. 25	F. E. Moxley.....	5.60	3,770	July 11	Bloomburg and Moxley	4.31	1,550

Daily discharge, in second-feet, of Yakima River at Umtanum, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	690	1,570	1,840	790	1,320	1,990	2,870	3,070	3,710	2,030	1,280	1,220
2.....	865	1,440	1,770	790	1,320	1,990	2,680	3,950	4,200	2,030	1,280	1,280
3.....	960	1,320	1,770	790	1,210	1,770	2,680	4,930	4,730	2,030	1,280	1,280
4.....	1,060	1,440	1,700	745	1,260	1,700	2,870	6,040	4,730	2,110	1,280	1,280
5.....	1,110	1,260	1,700	790	1,260	1,700	3,720	5,470	4,200	2,110	1,280	1,280
6.....	1,260	1,320	1,700	1,500	1,260	1,570	4,180	4,670	3,260	1,950	1,280	1,280
7.....	1,420	1,380	1,770	1,990	1,210	1,640	4,180	4,180	2,650	1,880	1,400	1,220
8.....	1,480	1,380	1,700	2,680	1,210	1,700	4,420	4,180	2,560	1,730	1,460	1,220
9.....	1,420	1,380	1,700	2,870	1,160	2,070	4,930	4,180	2,370	1,660	1,460	1,170
10.....	1,420	1,380	1,640	2,500	1,100	1,990	5,750	3,950	2,030	1,600	1,460	1,120
11.....	1,480	1,320	1,700	2,410	1,100	1,840	6,040	4,180	1,950	1,600	1,530	1,060
12.....	1,600	1,260	1,700	2,240	1,100	1,920	6,340	4,180	1,950	1,600	1,460	1,060
13.....	1,800	1,380	1,640	2,150	1,040	1,920	6,040	4,670	2,370	1,730	1,460	1,060
14.....	1,870	1,380	1,640	1,990	1,040	2,150	5,750	5,470	2,560	1,730	1,460	940
15.....	2,020	1,210	1,570	1,920	1,040	2,500	6,040	6,650	3,050	1,530	1,460	990
16.....	2,020	1,160	1,500	1,840	1,040	2,870	6,340	7,500	3,480	1,460	1,530	1,040
17.....	2,500	990	1,500	1,840	1,040	3,950	6,040	7,500	3,710	1,460	1,600	1,040
18.....	2,410	1,040	1,440	1,770	990	4,180	5,200	6,830	3,710	1,530	1,600	1,040
19.....	2,410	990	1,440	1,700	990	4,420	5,200	5,880	3,710	1,460	1,600	1,100
20.....	2,150	790	1,380	1,640	990	4,670	6,040	5,580	3,260	1,400	1,530	1,100
21.....	2,070	745	1,260	1,570	1,160	4,420	6,040	5,580	2,850	1,400	1,530	1,100
22.....	2,070	745	1,210	1,570	1,260	4,420	5,470	5,580	2,650	1,340	1,530	1,100
23.....	2,070	790	1,160	1,570	1,210	4,420	4,420	6,190	2,280	1,340	1,460	1,100
24.....	1,990	790	1,100	1,640	1,210	4,180	3,950	6,830	2,110	1,280	1,460	1,100
25.....	1,990	790	1,100	1,500	1,320	3,950	3,720	6,190	2,200	1,280	1,530	1,100
26.....	2,070	890	1,040	1,440	1,440	3,950	3,500	5,580	2,110	1,340	1,530	1,100
27.....	1,990	1,100	1,040	1,380	1,500	3,720	3,500	5,010	1,950	1,340	1,460	1,100
28.....	1,840	1,440	990	1,320	2,150	3,500	3,500	4,730	1,950	1,340	1,400	1,100
29.....	1,770	1,570	940	1,320	-----	3,500	3,280	4,200	2,030	1,340	1,400	990
30.....	1,640	1,840	940	1,320	-----	3,070	2,870	3,710	1,950	1,280	1,400	990
31.....	1,640	-----	940	1,260	-----	2,870	-----	3,480	-----	1,280	1,220	-----

NOTE.—Discharge determined from four fairly well-defined rating curves applicable: Oct. 1-16; Oct. 17 to May 15; May 16 to Sept. 13; and Sept. 14-30.

Monthly discharge of Yakima River at Umtanum, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2,500	690	1,710	105,000	B.
November.....	1,840	745	1,200	71,600	B.
December.....	1,840	940	1,440	88,500	B.
January.....	2,870	745	1,640	101,000	B.
February.....	2,150	990	1,210	67,300	B.
March.....	4,670	1,570	2,920	180,000	B.
April.....	6,340	2,680	4,590	273,000	B.
May.....	7,500	3,070	5,160	318,000	B.
June.....	4,730	1,950	2,880	171,000	B.
July.....	2,110	1,280	1,590	97,600	A.
August.....	1,600	1,220	1,440	88,500	A.
September.....	1,280	940	1,120	66,600	A.
The year.....	7,500	690	2,250	1,630,000	

YAKIMA RIVER AT UNION GAP, NEAR YAKIMA, WASH.¹

LOCATION.—In sec. 17, T. 12 N., R. 19 E., at Union Gap, about a mile south of Yakima City, 600 feet below the mouth of Ahtanum Creek, and 600 feet above the New Reservation canal (the proposed Wapato Unit canal).

DRAINAGE AREA.—3,550 square miles.

RECORDS AVAILABLE.—August 19, 1895, to December 31, 1909; April 1, 1911, to September 30, 1914. Some fragmentary records in 1893 and 1894.

GAGE.—Stevens water-stage recorder installed July 29, 1912; vertical and inclined staff fixed to stilling box. Original gage established August 14, 1893, was an inclined and vertical staff. Several staff gages were read at different times but the same datum was maintained prior to December 31, 1909, when the station was discontinued; when reestablished April 1, 1911, the gage was set at a new datum.

DISCHARGE MEASUREMENTS.—Made from cable at the gage. Prior to 1908 measurements were made from cable 1,000 feet below old county bridge.

CHANNEL AND CONTROL.—Shifts in floods; changes in rating curve frequent. A by-channel carries a small part of the flow at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from water-stage recorder sheets, 5.08 feet at 3 p. m. May 16 (discharge, 14,400 second-feet); minimum stage, from water-stage recorder sheets, 1.09 feet at 2 p. m. September 12 (discharge, 865 second-feet).

1896–1914: Maximum stage recorded, 15.68 feet (about 19.3 feet present datum) November 15, 1906 (discharge, approximately, 63,900 second-feet); minimum stage recorded, 3.35 feet August 23, 27–28, and September 3–6, 1906 (discharge, 635 second-feet).

WINTER FLOW.—Discharge relation occasionally seriously affected by ice.

COOPERATION.—Records furnished by United States Reclamation Service.

Records obtained at this station show water passing through Union Gap, except 20 to 25 second-feet that has been diverted past the gage since 1906 by the Union Gap Irrigation Co. for use on bench lands above the Sunnyside canal.

Discharge measurements of Yakima River at Union Gap, near Yakima, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Nov. 7	Moxley and Reed.....	2.06	2,310	June 20	F. E. Moxley.....	3.38	6,420
Dec. 5	Moxley and Parker.....	2.24	2,620	July 8	Moxley and Bloomsburg.....	2.32	2,720
29	F. E. Moxley.....	1.60	1,500	13	W. Bloomsburg.....	2.12	2,370
Jan. 8	.....do.....	3.80	7,370	Aug. 31	Moxley and Calland.....	1.15	1,160
Mar. 2	.....do.....	2.59	3,940	Sept. 1	.....do.....	1.04	1,050
17	.....do.....	3.54	6,710	14	F. E. Moxley.....	1.24	1,080
May 12	.....do.....	3.80	7,810	28	Moxley and Tuttle.....	1.90	1,750
26	.....do.....	4.32	10,200				

¹ For full discussion of the discharge of the Yakima at Union Gap see U. S. Geol. Survey Water-Supply Paper 369, pp. 47–59, 1915.

Daily discharge, in second-feet, of Yakima River at Union Gap, near Yakima, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,210	2,240	2,980	1,400	2,390	3,730	4,780	6,030	8,030	3,810	1,670	1,030
2	1,540	2,240	2,790	1,400	2,390	3,980	4,780	7,210	10,200	3,810	1,670	1,360
3	1,760	2,070	2,600	1,400	2,200	3,490	4,510	10,200	11,800	4,050	1,760	1,510
4	1,840	1,910	2,600	1,400	2,490	3,490	5,060	11,800	10,700	5,150	1,670	1,340
5	1,910	1,910	2,420	2,200	2,300	3,490	6,410	11,200	8,880	4,860	1,760	1,470
6	2,160	1,990	2,600	5,680	2,110	3,490	7,210	9,770	7,620	4,580	1,670	1,470
7	2,420	2,160	2,600	7,620	2,020	3,490	8,030	8,880	6,030	3,590	1,760	1,400
8	2,420	2,070	2,600	8,030	2,200	3,730	8,030	8,880	5,060	2,600	1,590	1,340
9	2,420	2,070	2,600	7,620	1,840	4,240	8,880	7,620	4,780	2,600	1,760	1,340
10	2,420	1,990	2,420	6,410	1,930	4,510	9,770	7,620	4,240	2,330	1,930	1,210
11	2,420	1,990	2,420	5,360	1,930	3,980	10,700	8,030	4,240	2,160	1,590	927
12	2,790	1,910	2,420	4,780	1,930	4,240	11,200	8,030	3,980	2,070	1,670	875
13	2,790	1,910	2,420	4,780	1,930	4,240	11,200	8,880	4,510	2,420	1,760	930
14	3,180	2,160	2,240	4,510	1,840	4,780	11,800	10,700	4,510	2,790	1,840	1,040
15	2,980	2,070	2,240	4,240	1,840	5,360	12,800	13,400	5,360	2,330	1,670	1,150
16	2,980	1,840	2,070	3,980	1,840	5,680	14,000	14,000	6,030	1,990	1,590	1,340
17	2,980	1,760	2,070	3,980	1,840	7,210	12,300	14,000	7,210	1,760	1,760	1,400
18	2,980	1,910	2,070	3,490	1,840	8,450	11,800	12,800	7,210	1,760	1,760	1,610
19	2,790	2,070	1,990	3,490	1,840	9,320	11,200	11,200	7,210	1,760	1,760	1,840
20	2,790	1,610	1,990	3,490	1,840	9,320	12,300	10,200	6,410	1,610	1,670	2,160
21	2,790	1,470	1,910	3,250	2,300	9,320	12,300	10,200	6,030	1,610	1,510	2,160
22	2,790	1,470	1,760	3,020	2,910	8,880	10,700	10,200	4,510	1,470	1,440	1,990
23	2,790	1,540	1,690	3,250	2,390	8,880	9,770	11,200	3,980	1,340	1,360	1,840
24	2,790	1,610	1,610	3,250	2,390	8,450	8,030	12,300	3,490	1,210	1,440	1,680
25	2,790	1,760	1,610	3,020	2,590	7,620	7,620	11,200	3,590	1,210	1,360	1,680
26	2,790	1,840	1,610	2,910	2,700	7,210	7,210	10,700	3,380	1,280	1,510	1,680
27	2,790	2,070	1,540	2,800	2,700	6,810	7,210	9,770	3,180	1,840	1,590	1,840
28	2,790	2,420	1,470	2,700	3,490	6,410	7,210	8,880	3,180	1,670	1,440	1,910
29	2,600	2,790	1,470	2,590	-----	5,680	6,030	8,030	3,590	1,670	1,440	1,610
30	2,420	2,980	1,470	2,590	-----	5,360	5,680	7,210	3,590	1,590	1,590	1,540
31	2,330	-----	1,470	2,490	-----	5,060	-----	7,210	-----	1,670	1,220	-----

NOTE.—Discharge determined from two well-defined rating curves, one applicable Oct. 1 to Jan. 4, June 25 to July 26, and Sept. 4–30; the other applicable Jan. 5 to June 24, and July 27 to Sept. 3.

Monthly discharge of Yakima River at Union Gap, near Yakima, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October	3,180	1,210	2,530	156,000	B.
November	2,980	1,470	1,990	119,000	B.
December	2,980	1,470	2,120	130,000	A.
January	8,030	1,400	3,780	232,000	B.
February	3,490	1,840	2,210	123,000	A.
March	9,320	3,490	5,800	357,000	A.
April	14,000	4,510	8,950	532,000	A.
May	14,000	6,030	9,910	609,000	A.
June	11,800	3,180	5,750	342,000	A.
July	5,150	1,210	2,410	148,000	B.
August	1,930	1,220	1,620	99,600	B.
September	2,160	875	1,490	88,700	B.
The year	14,000	875	4,060	2,940,000	

YAKIMA RIVER NEAR WAPATO, WASH.

LOCATION.—In sec. 28, T. 12 N., R. 19 E., 500 feet below headgates of Sunnyside canal, and 2 miles below Union Gap, 3 miles north of Wapato, and 8 miles below North Yakima.

DRAINAGE AREA.—3,560 square miles (measured from topographic and county and other maps; large part of area approximately defined by drainage lines).

RECORDS AVAILABLE.—April 25, 1908, to September 30, 1914.

GAGE.—Cantilever chain on left bank; datum lowered 2.00 feet January 1, 1914.

DISCHARGE MEASUREMENTS.—Made from cable or, at very low stages, by wading.

CHANNEL AND CONTROL.—Solid rock, large boulders, and gravel; control may shift slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.54 feet at 6 a. m. May 16 (discharge, 11,400 second-feet); minimum stage recorded, 1.59 feet at 5.45 a. m. and 6.30 p. m. September 1 (discharge, 18 second-feet).

1908-1914: Maximum stage recorded, 9.82 feet November 25, 1909 (discharge, 33,400 second-feet); minimum stage recorded, -0.65 foot October 26, 1911 (discharge, practically zero).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—The Sunnyside, Old and New Reservation, and Union Gap Irrigation Co. canals divert water past the station.

REGULATION.—Flow partly regulated by storage and release of water in Keechelus, Kachess, Cle Elum, and Bumping reservoirs.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River near Wapato, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Nov. 1	Moxley and Reed.....	a 2.94	2,300	July 24	Paul Taylor.....	1.89	48
Dec. 5	Parker and Moxley.....	a 3.17	2,560	25	Bloomsburg and Moxley.....	1.70	27.3
29	F. E. Moxley.....	a 2.30	1,440	Aug. 3	W. Bloomsburg.....	2.13	90.0
May 12	.....do.....	6.80	5,930	17	Humphrey and Bates..	2.07	76.1
25	.....do.....	7.97	9,250	Sept. 1	Calland and Moxley....	1.61	19.1
June 8	H. W. Humphrey.....	5.94	3,660	12	F. E. Moxley.....	2.07	77.2
19	.....do.....	6.43	4,700	28	Moxley and Tuttle.....	3.83	1,020
July 3	.....do.....	4.61	1,780				
13	.....do.....	3.43	695				

^a Gage heights prior to Jan. 1, 1914, referred to original datum, which is 2.00 feet higher than one used subsequent to Jan. 1, 1914.

Daily discharge, in second-feet, of Yakima River near Wapato, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	401	1,930	3,130	1,340	2,340	3,660	4,240	4,440	6,000	1,560	95	18
2.....	407	1,930	3,130	1,450	2,340	3,850	4,040	6,000	7,960	1,680	76	33
3.....	651	1,930	2,960	1,450	2,340	3,480	4,040	7,960	8,610	1,680	114	99
4.....	752	1,930	2,800	1,450	2,340	3,480	4,240	8,950	8,280	1,800	176	166
5.....	900	1,800	2,640	3,480	2,340	3,300	5,080	8,610	6,780	1,680	166	315
6.....	1,230	1,800	2,490	5,300	2,060	3,300	6,000	7,350	5,530	1,340	107	355
7.....	1,560	1,800	2,490	6,510	2,060	3,300	6,250	6,780	4,650	1,180	107	267
8.....	1,800	1,800	2,490	7,350	2,200	3,480	6,510	6,510	3,850	985	80	391
9.....	1,560	1,800	2,340	7,060	2,060	4,240	6,780	6,000	3,300	823	101	263
10.....	1,560	1,800	2,340	5,760	2,060	4,440	7,350	5,530	2,800	684	153	246
11.....	1,800	1,800	2,340	5,300	1,930	4,040	8,280	5,530	2,490	558	80	78
12.....	2,340	1,680	2,340	5,080	1,930	4,040	8,610	5,760	2,490	499	107	62
13.....	2,490	1,680	2,340	4,860	1,930	4,040	8,610	6,250	2,960	751	156	111
14.....	2,640	1,680	2,200	4,650	1,930	4,440	8,950	7,960	3,130	900	111	173
15.....	2,640	1,800	2,060	4,440	1,800	5,300	9,660	10,000	3,850	684	69	340
16.....	2,800	1,800	2,060	4,040	1,800	5,530	10,400	11,200	4,440	528	44	499
17.....	2,640	1,800	2,060	3,850	1,800	6,510	9,660	10,800	5,080	412	97	651
18.....	2,640	1,930	1,930	3,850	1,680	7,650	8,610	9,660	5,300	471	93	751
19.....	2,800	1,800	1,930	3,850	1,930	8,280	8,610	8,610	4,860	396	93	940
20.....	2,800	1,680	1,800	3,660	2,060	8,610	10,000	7,960	4,240	325	73	1,180
21.....	2,490	1,560	1,800	3,480	2,640	7,960	10,000	7,650	3,480	267	37	1,030
22.....	2,490	1,560	1,680	3,130	2,800	7,960	8,610	7,960	2,800	169	24	940
23.....	2,490	1,450	1,560	3,130	2,340	7,650	7,350	8,610	2,200	104	25	823
24.....	2,490	1,450	1,560	3,130	2,490	7,350	6,250	9,660	1,930	40	32	823
25.....	2,340	1,340	1,450	2,960	2,490	7,060	5,760	9,300	2,060	37	42	786
26.....	2,490	1,680	1,340	2,960	2,490	6,510	5,300	8,610	1,930	97	76	823
27.....	2,340	1,930	1,340	2,800	2,640	6,250	5,300	7,650	1,680	156	163	940
28.....	2,340	2,340	1,230	2,640	3,300	5,760	5,080	6,780	1,560	107	144	940
29.....	2,490	2,640	1,230	2,490	.....	5,300	4,650	6,250	1,560	60	360	717
30.....	2,200	2,960	1,340	2,340	.....	4,860	4,440	5,530	1,560	74	417	620
31.....	1,930	.....	1,340	2,200	.....	4,440	.....	5,530	.....	80	23	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Yakima River near Wapato, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	2,800	401	2,020	124,000	A.
November.....	2,960	1,340	1,840	109,000	A.
December.....	3,130	1,230	2,060	127,000	A.
January.....	7,350	1,340	3,740	230,000	A.
February.....	3,300	1,680	2,220	123,000	A.
March.....	8,610	3,300	5,360	329,000	A.
April.....	10,400	4,040	6,960	414,000	A.
May.....	11,200	4,440	7,590	467,000	A.
June.....	8,610	1,560	3,910	233,000	A.
July.....	1,800	37	649	39,900	B.
August.....	417	23	111	6,820	B.
September.....	1,180	18	513	30,500	B.
The year.....	11,200	18	3,080	2,230,000	

YAKIMA RIVER NEAR PROSSER, WASH.

LOCATION.—In the SE. $\frac{1}{4}$ sec. 36, T. 9 N., R. 24 E., about $1\frac{1}{4}$ miles below Prosser.

DRAINAGE AREA.—5,340 square miles.

RECORDS AVAILABLE.—June 1 to October 10, 1904; June 8 to December 30, 1905; February 1 to October 12, 1906; August 4, 1913, to September 30, 1914.

GAGE.—Stevens water-stage recorder referred to inclined and vertical staff. The gage used in 1904 and 1905 was at Prosser highway bridge about a mile above present gage. The gage used in 1906 was at practically the same site as present gage, but at different datum.

DISCHARGE MEASUREMENTS.—Made from cable about 1,000 feet above gage, or by wading.

CHANNEL AND CONTROL.—Solid rock on left side; large boulders on right side. Control is a broad riffle; not likely to shift except at extreme high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 8.10 feet at 2 a. m. April 17, 1914 (discharge, 11,300 second-feet); minimum stage, 1.07 feet at 6 p. m. August 24, 1914.

1904-1906 and 1914: Maximum flow measured by floats (not referred to gage) at a stage three-fourths inch below crest of flood, at 3 p. m. November 17, 1906, 62,800 second-feet; maximum stage, unmeasured, occurred about 9 a. m. November 17, 1906; minimum stage recorded, 2.60 feet August 19, 26, 30, 21, and September 30, 1906 (discharge, approximately, 40 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Numerous above station; impracticable to correct records for storage.

REGULATION.—Flow partly regulated by storage and release of water at Keechelus, Kachess, Cle Elum, and Bumping reservoirs.

ACCURACY.—Results good except at low stages when accurate discharge measurements are difficult to obtain.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Yakima River near Prosser, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 10	R. K. Ray.....	3.32	1,970	May 29	F. E. Moxley.....	6.57	7,440
Nov. 24	F. E. Moxley.....	3.27	2,000	June 25	H. W. Humphrey.....	3.71	2,090
Dec. 9	Parker and Taylor.....	4.12	2,980	July 24	Bloomsburg and Mox- ley.....	1.78	674
Mar. 18	F. E. Moxley.....	6.68	7,640	Aug. 7	H. W. Humphrey.....	1.32	396
Apr. 29	.....do.....	5.89	5,970	Aug. 21	.....do.....	1.18	405
May 13	.....do.....	6.09	6,330	Sept. 18	.....do.....	2.10	877
May 26	Paul Taylor.....	7.42	9,490				

Daily discharge, in second-feet, of Yakima River near Prosser, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	596	2,580	3,100	1,990	3,240	4,630	5,550	5,170	6,150	2,100	400	545
2.....	623	2,780	3,170	1,940	3,240	4,810	5,350	5,350	7,010	2,100	374	467
3.....	738	2,710	3,100	1,940	3,100	4,810	5,170	6,790	8,400	2,100	400	458
4.....	865	2,580	3,040	1,940	2,970	4,630	4,990	8,920	9,180	2,100	400	454
5.....	1,010	2,520	3,040	1,990	3,040	4,290	5,350	9,700	8,160	2,160	386	486
6.....	1,090	2,460	3,040	3,670	2,900	4,290	6,150	8,920	7,010	2,100	378	570
7.....	1,360	2,520	3,040	6,150	2,710	4,290	7,010	7,920	5,950	1,880	417	679
8.....	1,720	2,710	3,040	7,680	2,710	4,450	7,010	7,450	4,990	1,720	413	679
9.....	1,880	2,640	2,970	7,680	2,710	4,810	7,230	7,010	4,450	1,560	391	679
10.....	1,990	2,580	2,970	7,230	2,710	5,170	7,680	6,350	3,820	1,410	374	708
11.....	1,990	2,580	2,840	6,570	2,640	5,170	8,160	6,150	3,310	1,260	417	679
12.....	2,220	2,710	2,840	6,150	2,580	4,990	8,920	6,150	3,100	1,090	444	623
13.....	2,520	2,580	2,780	5,750	2,520	4,990	9,180	6,350	3,100	1,090	417	545
14.....	2,900	2,580	2,780	5,350	2,520	5,170	9,440	7,010	3,310	1,260	365	570
15.....	1,660	1,580	2,710	4,990	2,460	5,550	8,660	3,520	3,520	1,360	365	570
16.....	3,100	2,460	2,710	4,810	2,400	6,150	11,000	10,500	4,130	1,410	374	596
17.....	3,170	2,460	2,640	4,630	2,460	6,570	11,300	11,000	4,810	1,220	374	738
18.....	3,100	2,340	2,580	4,450	2,400	7,680	10,500	10,700	5,350	1,050	369	865
19.....	3,040	2,340	2,520	4,290	2,340	8,660	9,440	9,960	5,350	972	374	972
20.....	3,040	2,340	2,460	4,130	2,340	9,180	9,960	8,920	4,990	935	369	1,180
21.....	3,040	2,220	2,520	3,970	2,460	9,180	11,000	8,400	4,450	800	378	1,360
22.....	2,900	1,940	2,340	3,970	3,240	9,180	10,500	8,160	3,820	738	378	1,360
23.....	2,900	1,940	2,280	4,450	3,520	8,920	9,440	8,660	3,310	708	374	1,260
24.....	2,900	1,990	2,220	4,290	3,170	8,920	8,160	9,440	2,900	679	332	1,220
25.....	2,840	1,990	2,160	3,970	3,310	8,400	7,230	9,700	2,580	623	374	1,180
26.....	2,970	2,100	2,160	3,970	3,520	7,920	6,570	9,440	2,520	545	440	1,180
27.....	2,780	2,160	2,100	3,970	3,520	7,680	6,350	8,660	2,520	570	431	1,220
28.....	2,900	2,340	2,100	3,670	3,970	7,230	6,150	8,160	2,280	570	426	1,310
29.....	2,840	2,640	2,040	3,450	.....	6,790	5,950	7,450	2,160	482	440	1,360
30.....	2,716	3,040	1,990	3,380	.....	6,150	5,550	6,790	2,100	463	435	1,220
31.....	2,520	.....	1,990	3,380	.....	5,950	.....	6,150	.....	454	550	.....

NOTE.—Discharge determined from a rating curve well defined between 800 and 10,000 second-feet.

Monthly discharge of Yakima River near Prosser, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	3,170	596	2,260	139,000	A.
November.....	3,040	1,940	2,450	146,000	A.
December.....	3,170	1,990	2,620	161,000	A.
January.....	7,680	1,940	4,380	269,000	A.
February.....	3,970	2,340	2,880	160,000	A.
March.....	9,180	4,290	6,340	390,000	A.
April.....	11,300	4,990	7,880	469,000	A.
May.....	11,000	5,170	8,060	496,000	A.
June.....	9,180	2,100	4,490	267,000	A.
July.....	2,160	454	1,220	75,000	A.
August.....	550	332	399	24,500	C.
September.....	1,360	454	858	51,100	A.
The year.....	11,300	332	3,660	2,650,000	

YAKIMA RIVER AT KIONA, WASH.

LOCATION.—In sec. 19, T. 9 N., R. 27 E., at highway bridge about 500 feet north of Kiona, about $3\frac{1}{2}$ miles below intake of Kiona canal and about 25 miles above the mouth.

DRAINAGE AREA.—5,520 square miles; revised value.

RECORDS AVAILABLE.—August 20, 1895, to September 30, 1914.

GAGE.—Chain attached to upstream guard rail of bridge.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading at the riffle 1,000 feet below the gage.

CHANNEL AND CONTROL.—Shifts slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year: 10.06 feet at 9 a. m. April 17 (discharge, 11,200 second-feet); minimum stage recorded, 3.09 feet at 9 a. m. August 9 (discharge, 321 second-feet).

1896-1914: Maximum stage recorded, 19.78 feet November 17, 1906 (discharge, 63,500 second-feet); minimum stage recorded, 2.35 feet September 11, 1906 (discharge, 105 second-feet).

Minimum stage recorded for the year differs from that given in the daily discharge table, because gage heights were used to tenths of feet in computing those discharges.

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Numerous.

REGULATION.—Flow partly regulated by storage and release of water in Keechelus, Kachess, Cle Elum, and Bumping reservoirs.

COOPERATION.—Records furnished by the United States Reclamation Service.

Discharge measurements of Yakima River at Kiona, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 9	R. K. Ray.....	5.18	2,040	July 14	H. W. Humphrey.....	4.31	1,040
Dec. 8	Taylor and Parker....	5.97	2,880	21	Bloomsburg and Mox-ley.....	3.99	850
Apr. 27	Humphrey and Mox-ley.....	7.99	6,250	Aug. 11	H. W. Humphrey.....	3.20	392
May 14	H. W. Humphrey.....	8.39	6,830	24	.....do.....	3.17	371
June 1	.....do.....	7.87	6,010	Sept. 8	.....do.....	3.74	661
15	.....do.....	6.33	3,400	21	.....do.....	4.61	1,380
30	.....do.....	5.32	1,910				

Daily discharge, in second-feet, of Yakima River at Kiona, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	670	2,430	3,010	1,710	3,010	4,330	5,410	5,040	6,000	1,930	448	600
2.....	705	2,430	3,010	1,600	2,860	4,680	5,220	5,040	6,400	1,820	395	505
3.....	740	2,570	3,010	1,600	2,860	5,040	5,040	6,200	7,840	1,930	370	475
4.....	920	2,430	2,860	1,710	2,710	4,680	4,860	5,280	9,710	1,930	395	448
5.....	1,040	2,300	2,860	1,710	2,570	4,330	4,860	9,710	8,280	1,930	395	475
6.....	1,160	2,300	2,710	2,300	2,710	4,330	6,000	8,980	7,000	1,930	370	535
7.....	1,380	2,300	2,710	5,600	2,430	4,330	6,800	8,060	6,000	1,710	395	632
8.....	1,680	2,300	2,710	7,620	2,430	4,500	7,200	7,410	4,860	1,600	420	665
9.....	1,900	2,300	2,710	7,840	2,710	4,680	7,200	7,000	4,160	1,410	325	665
10.....	2,020	2,300	2,710	7,200	2,430	5,220	7,620	6,400	3,170	1,320	347	700
11.....	1,900	2,300	2,570	6,800	2,300	5,220	8,060	6,000	3,170	1,140	370	665
12.....	2,140	2,430	2,570	6,400	2,300	4,860	8,740	6,200	2,710	1,010	420	632
13.....	2,680	2,300	2,570	5,800	2,300	4,860	9,220	6,400	2,710	1,010	475	448
14.....	2,680	2,300	2,570	5,600	2,170	4,860	9,220	6,800	2,860	1,160	395	505
15.....	3,100	2,430	2,570	5,040	2,300	5,410	9,960	8,280	2,860	1,580	370	567
16.....	3,250	2,300	2,430	4,680	2,170	6,200	10,700	10,200	3,200	1,480	420	567
17.....	3,250	2,300	2,430	4,500	2,170	6,400	11,300	11,000	4,500	1,300	347	665
18.....	2,860	2,170	2,300	4,500	2,050	7,200	10,500	10,700	5,220	1,200	420	843
19.....	2,860	2,170	2,300	4,160	2,050	8,510	9,710	9,960	5,220	1,040	420	1,000
20.....	2,860	2,050	2,170	3,820	2,050	9,220	9,460	9,960	5,220	960	395	1,120
21.....	2,860	2,050	2,050	3,820	2,170	9,220	11,000	8,280	4,500	880	395	1,390
22.....	2,710	1,820	2,050	3,820	2,430	8,980	10,700	8,060	3,650	770	420	1,390
23.....	2,710	1,710	2,050	4,160	3,490	8,980	10,500	8,510	3,170	735	370	1,390
24.....	2,710	1,710	1,930	4,160	3,010	8,740	9,710	8,980	2,710	632	347	1,300
25.....	2,710	1,820	1,930	3,820	2,860	8,510	8,280	9,710	2,300	600	395	1,260
26.....	2,710	1,820	1,820	3,820	3,490	8,060	7,410	9,460	2,300	505	475	1,260
27.....	2,710	1,820	1,820	3,650	3,490	7,840	6,400	8,510	2,300	505	475	1,210
28.....	2,570	2,050	1,820	3,490	3,650	7,000	6,200	8,060	2,170	567	448	1,300
29.....	2,570	2,300	1,820	3,330	.....	6,800	6,000	7,620	1,930	475	475	1,390
30.....	2,570	2,710	1,710	3,170	.....	6,400	5,600	6,800	1,930	475	448	1,260
31.....	2,430	.....	1,710	3,170	.....	6,000	.....	6,200	.....	475	420	.....

NOTE.—Discharge determined from three well-defined rating curves applicable Oct. 1-17, Oct. 18 to July 13, and July 14 to Sept. 30.

Monthly discharge of Yakima River at Kiona, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	3,250	670	2,230	137,000	B.
November.....	2,710	1,710	2,210	131,000	B.
December.....	3,010	1,710	2,370	146,000	A.
January.....	7,840	1,600	4,210	259,000	A.
February.....	3,650	2,050	2,610	145,000	A.
March.....	9,220	4,330	6,300	387,000	A.
April.....	11,300	4,860	7,960	474,000	A.
May.....	11,000	5,040	7,990	491,000	A.
June.....	9,710	1,930	4,290	255,000	A.
July.....	1,930	475	1,160	71,200	B.
August.....	475	.....	405	24,900	B.
September.....	1,390	448	862	51,300	A.
The year.....	11,300	325	3,560	2,570,000	

KACHESS LAKE NEAR EASTON, WASH.

LOCATION.—In sec. 34, T. 21 N., R. 13 E. (unsurveyed), at lake outlet, $2\frac{1}{2}$ miles north-west of Easton.

DRAINAGE AREA.—63 square miles.

RECORDS AVAILABLE.—September 20, 1905, to September 30, 1914.

GAGE.—Owing to construction work several temporary gages were read in 1914, but each was referred to sea-level datum. Original gage was a vertical staff 300 feet above outlet at datum 2,226.02 feet above sea level. A gage painted on side of gate-house tower, graduated to read elevations above mean sea level, was used after September 6, 1911.

EXTREMES OF STAGE.—Maximum stage recorded during year, 34 feet June 27 to July 1; minimum stage recorded, 2.90 feet at 7.45 a. m. September 30.

1906-1914: Maximum stage recorded, 35.5 feet at 6 p. m. November 15, 1906; minimum stage recorded, 0.75 foot April 9-11, 1913. Add 2,200 feet to gage heights to obtain sea-level elevations.

STORAGE.—Storage in the lake controlled by head gates in dam. Present elevation of sills of gates 2,192.75 feet, lowered from 2,226.02 in September, 1911.

COOPERATION.—Records furnished by the United States Reclamation Service.

Daily capacity, in acre-feet, of Kachess Lake near Easton, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	88,960	52,600	53,800	47,450	56,500	53,800	73,750	96,400	116,250	122,200	106,275	58,750
2.....	87,460	52,300	53,800	47,450	56,500	54,700	74,050	97,300	116,775	122,025	105,575	56,800
3.....	86,110	52,000	53,650	47,313	56,500	55,150	74,500	99,100	117,300	122,025	104,700	54,850
4.....	84,610	51,850	53,500	47,450	56,650	55,600	75,250	100,900	117,300	121,850	103,825	53,050
5.....	82,510	51,550	53,050	48,000	56,500	55,900	75,850	102,250	117,125	121,675	102,950	51,400
6.....	80,710	51,400	52,900	48,825	56,500	56,200	76,600	103,300	116,775	121,675	101,900	49,925
7.....	79,210	51,400	52,600	50,500	56,200	56,500	77,500	104,525	116,425	121,500	100,300	48,825
8.....	77,050	51,250	52,450	52,000	55,900	56,800	78,400	105,750	116,250	121,325	98,800	47,725
9.....	75,400	50,950	52,300	52,900	55,900	57,100	78,400	106,800	115,900	120,975	97,300	47,175
10.....	73,300	50,650	52,000	53,650	55,900	57,400	78,100	108,200	115,900	120,625	96,950	46,488
11.....	72,400	50,500	51,850	54,400	55,600	57,700	77,950	109,250	115,900	120,275	94,450	45,938
12.....	71,200	50,200	51,550	55,000	55,300	58,000	77,100	110,650	116,075	119,925	92,800	45,388
13.....	70,300	50,065	51,400	55,150	55,150	58,600	78,250	112,050	116,250	119,225	91,000	44,425
14.....	69,400	49,790	51,100	55,150	55,000	59,200	79,300	113,800	116,425	118,525	89,200	43,462
15.....	68,200	49,515	50,800	55,300	54,850	59,800	80,650	115,550	116,600	118,525	87,550	42,500
16.....	67,000	49,375	50,500	55,450	54,700	60,700	82,600	116,950	116,950	118,350	85,900	41,125
17.....	65,500	49,375	50,200	55,450	54,400	61,600	84,100	116,950	117,300	117,650	84,100	40,162
18.....	64,000	49,650	49,925	55,450	54,100	62,500	85,300	116,950	117,650	116,950	82,300	38,925
19.....	62,800	50,200	49,375	55,600	53,800	63,700	86,500	116,775	117,650	116,250	80,350	37,962
20.....	61,900	50,800	49,100	55,750	53,500	64,750	88,000	116,900	118,000	115,550	78,550	36,725
21.....	60,850	51,400	48,825	55,600	53,500	65,950	88,450	116,425	118,770	114,850	76,750	35,625
22.....	59,950	52,000	48,690	55,900	53,800	66,700	88,300	117,125	119,540	113,975	74,950	34,800
23.....	59,200	52,450	48,560	56,200	53,500	67,600	88,900	117,475	120,310	113,100	73,000	33,700
24.....	58,300	52,900	48,275	56,200	53,650	68,650	89,950	117,650	120,800	112,225	71,200	32,875
25.....	57,400	53,200	48,000	56,200	53,500	69,700	91,000	117,650	121,500	111,175	69,400	31,775
26.....	56,200	53,500	47,725	56,200	53,200	70,600	91,900	117,300	121,850	110,125	67,600	31,225
27.....	55,300	53,500	47,725	56,200	53,500	71,200	92,800	116,950	122,200	109,075	65,800	30,400
28.....	54,400	53,500	47,500	56,200	53,500	71,800	94,000	116,600	122,300	108,200	63,700	29,575
29.....	53,800	53,350	47,450	56,200	.....	72,400	95,200	116,075	122,300	107,675	61,900	28,888
30.....	53,500	53,350	47,315	56,200	.....	73,000	96,650	115,900	122,200	107,325	61,150	27,925
31.....	53,050	.....	47,450	56,500	.....	73,300	.....	115,900	.....	106,800	60,700	.....

KACHESS RIVER NEAR EASTON, WASH.

LOCATION.—In sec. 3, T. 20 N., R. 13 E., about one-fourth mile below Kachess Lake storage dam and about 2 miles northwest of Easton.

DRAINAGE AREA.—63 square miles.

RECORDS AVAILABLE.—November 20, 1903, to September 30, 1914.

GAGE.—Stevens water-stage recorder on left bank referred to inclined staff.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Gravel bed with riffle control 100 feet below gage. Channel fairly permanent prior to beginning of work on dam; since that time it has shifted frequently.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.82 feet at 6 p. m. October 6 (discharge, 1,040 second-feet); minimum stage, 3.29 feet March 1-9 (discharge, approximately, 2 second-feet).

1903-1914: Maximum stage recorded, 8.0 feet at 8.30 a. m. November 16, 1906 (discharge, 1,760 second-feet.¹ Minimum flow occurs when gates in dam are closed (discharge, practically zero).

WINTER FLOW.—Discharge relation not affected by ice.

REGULATION.—Flow regulated by storage and release of water at Kachess Lake reservoir (capacity of 210,000 acre-feet). Records of stage have been kept on lake since September 20, 1905. Computations of monthly discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Kachess River near Easton, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 17	O. S. Reed.....	6.52	938	May 19	F. E. Moxley.....	5.82	658
Nov. 28	Parker and Taylor.....	4.32	239	June 15	Paul Taylor.....	4.57	326
Dec. 18	F. E. Moxley.....	4.30	239	July 29	Moxley and Blooms- burg.	4.49	286
Mar. 11	Paul Taylor.....	3.31	1.05				
May 9	F. E. Moxley.....	3.28	1.29	Aug. 17	W. Bloomsburg.....	6.48	916

¹Revised from original data. A stage of 7.5 feet was reached November 25, 1909, and the discharge of 1,790 second-feet published for this date in Water-Supply Paper 272, p. 174 and Water-Supply Paper 369 p. 62, is probably too large.

Daily discharge, in second-feet, of Kachess River near Easton, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	671	252	249	126	160	2	9	5	430	278	292	927
2.....	740	155	249	126	160	2	9	5	430	278	410	927
3.....	740	280	249	112	160	2	9	5	435	278	410	927
4.....	866	280	249	103	160	2	9	6	480	278	471	868
5.....	1,010	280	246	103	157	2	8	5	480	278	471	732
6.....	1,010	283	243	100	157	2	8	5	490	278	859	585
7.....	1,030	283	243	114	157	2	8	5	490	278	859	585
8.....	1,010	280	243	154	157	2	240	5	440	278	893	430
9.....	978	275	243	176	157	2	666	4	440	278	927	269
10.....	978	278	243	176	157	2	666	4	321	278	927	269
11.....	961	278	243	176	153	2	649	3	321	327	927	269
12.....	961	275	241	172	153	3	633	2	318	486	927	400
13.....	961	278	241	172	153	3	311	2	318	597	927	585
14.....	961	278	241	172	153	4	11	2	315	486	927	585
15.....	944	278	238	172	153	9	11	98	315	152	927	633
16.....	927	278	238	172	153	9	8	748	315	315	927	666
17.....	927	280	235	172	150	9	7	885	315	486	927	666
18.....	910	152	304	168	150	9	7	885	315	486	927	649
19.....	793	23	301	168	150	10	8	633	315	486	910	601
20.....	694	49	218	168	148	10	748	633	12	486	927	599
21.....	678	51	218	168	148	10	715	633	12	486	910	538
22.....	678	47	207	168	148	10	715	538	10	613	910	522
23.....	661	47	199	168	146	10	6	633	10	533	927	522
24.....	694	42	201	164	146	10	6	633	10	533	910	491
25.....	710	126	201	164	146	10	6	633	10	581	927	460
26.....	694	249	163	164	146	10	6	633	10	694	927	430
27.....	694	249	129	164	144	9	7	625	100	694	927	400
28.....	549	249	126	164	64	10	8	625	235	292	910	400
29.....	350	249	126	164	.....	9	7	560	278	292	613	430
30.....	350	249	126	160	.....	8	6	465	278	292	218	430
31.....	350	.....	126	160	.....	8	.....	425	.....	292	694	.....

NOTE.—Discharge determined as follows: Oct. 1-8 from a fairly well defined rating curve; Oct. 9 to Jan. 3 and June 10 to Sept. 3, from a rating curve well defined between 200 and 1,000 second-feet; Jan. 4 to Feb. 27, by indirect method for shifting channels; Feb. 28 to May 26, and Sept. 4 to Sept. 30, from a rating curve well defined between 80 and 700 second-feet; May 27 to June 9, by indirect method for shifting channels.

Monthly discharge of Kachess River near Easton, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 63 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge with- out storage (second-feet).		Run-off (depth in inches on drain- age area).	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored.	Without storage.	Mean.	Per square mile.		
October.....	1,030	350	790	48,600	-37,000	11,600	189	3.00	3.46	B.
November.....	283	23	212	12,600	+ 300	12,900	217	3.44	3.84	A.
December.....	304	126	219	13,500	- 5,800	7,600	124	1.97	2.27	A.
January.....	176	100	155	9,530	+ 9,050	18,600	302	4.79	5.52	C.
February.....	160	64	150	8,330	- 3,000	5,330	96.0	1.52	1.58	C.
March.....	10	2	6.2	381	+19,800	20,200	329	5.22	6.02	D.
April.....	748	6	184	10,900	+22,400	33,300	560	8.89	9.92	C.
May.....	885	2	334	20,500	+20,200	40,700	662	10.5	12.11	B.
June.....	490	10	275	16,400	+ 6,300	22,700	381	6.05	6.76	B.
July.....	694	152	400	24,600	-15,400	9,200	150	2.38	2.74	B.
August.....	927	218	795	48,900	-46,100	2,800	45.5	.722	.83	A.
September....	927	269	559	33,300	-32,800	500	8.40	.133	.15	A.
The year.....	1,030	2	342	248,000	-62,200	185,000	256	4.06	55.19	

CLE ELUM LAKE NEAR ROSLYN, WASH.

LOCATION.—In sec. 10, T. 20 N., R. 14 E., at lake outlet, 4 miles northwest of Roslyn, and about 7½ miles northwest of Cle Elum.

DRAINAGE AREA.—202 square miles.

RECORDS AVAILABLE.—January 25 to March 31, 1906; May 4 to June 9, 1906; October 1, 1906, to November 9, 1907; March 15, 1908, to September 30, 1914.

GAGE.—Vertical staff in 3 sections at left end of dam.

EXTREMES OF STAGE.—Maximum stage recorded during year, 14.20 feet at 6.30 a. m. May 16; minimum stage recorded, 2.30 feet September 15-18.

1906-1914: Maximum stage recorded, 16.70 feet November 24, 1909; minimum stage estimated: 1.15 feet ¹ August 31, 1906.

STORAGE.—Storage in lake controlled by gates in temporary dam.

ACCURACY.—Gage heights do not indicate true lake level when a large flow is passing over spillway, and particularly when the gates are opened, because of the slope in channel at lower end of lake.

COOPERATION.—Records furnished by United States Reclamation Service.

Daily capacity, in acre-feet, of Cle Elum Lake near Roslyn, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	5,290	8,005	25,795	6,300	8,508	10,656	20,279	25,796	28,436	26,948	21,020	5,800
2.....	5,175	7,730	25,270	6,300	8,424	11,404	19,773	27,188	29,348	27,140	20,624	5,500
3.....	5,045	7,460	24,790	6,280	8,340	11,888	19,152	29,588	29,876	27,284	20,164	5,215
4.....	4,970	7,240	24,380	6,220	8,298	12,592	18,853	29,876	29,204	27,284	19,681	4,949
5.....	4,890	7,100	23,325	6,460	8,214	13,340	19,290	29,300	28,388	27,140	19,267	4,778
6.....	4,910	7,100	22,340	7,794	7,920	13,824	20,647	28,772	27,716	26,900	18,738	4,702
7.....	4,930	7,160	21,740	10,326	7,752	14,368	21,908	28,580	27,236	26,660	18,278	4,531
8.....	4,930	7,140	20,785	13,010	7,605	14,997	24,452	28,436	26,876	26,468	17,887	4,474
9.....	4,875	7,020	19,980	13,824	7,360	15,518	25,508	28,292	26,612	26,324	17,404	4,455
10.....	4,910	6,980	18,945	14,184	7,300	16,047	26,132	28,316	26,420	26,276	17,036	4,455
11.....	5,195	6,900	17,910	14,460	7,200	16,714	26,516	28,460	26,420	26,228	16,438	4,398
12.....	6,660	6,900	16,300	14,460	6,920	17,496	26,636	28,772	26,612	26,180	15,886	4,360
13.....	7,960	6,780	15,150	14,460	6,880	18,209	26,660	29,300	27,020	26,276	15,426	4,246
14.....	8,760	7,420	14,345	14,414	6,680	18,876	26,972	30,020	27,452	26,180	14,920	4,189
15.....	9,865	8,800	13,780	14,184	6,580	20,394	27,404	30,750	27,980	26,132	14,414	4,170
16.....	10,040	9,390	12,460	13,912	6,460	21,836	27,620	30,850	28,460	26,132	13,560	4,170
17.....	9,840	12,131	11,690	12,790	6,300	23,036	27,380	30,260	28,796	26,036	13,032	4,170
18.....	9,645	13,800	11,140	12,900	6,200	24,500	27,668	29,663	28,868	25,892	12,350	4,170
19.....	9,410	16,300	10,370	12,592	6,160	25,436	28,004	29,300	28,580	25,820	11,800	4,294
20.....	9,370	17,565	9,710	11,932	6,080	26,036	28,320	29,180	28,172	25,892	11,680	4,455
21.....	9,350	18,185	9,220	11,514	6,380	26,660	28,700	29,396	27,788	25,652	11,052	4,588
22.....	9,390	19,475	8,675	11,162	7,160	26,852	28,148	29,636	27,332	25,508	10,524	4,626
23.....	9,390	20,740	8,170	10,766	7,340	26,900	27,716	29,732	26,900	25,124	9,952	4,550
24.....	9,220	21,885	7,815	10,678	7,794	26,876	27,478	29,828	26,776	24,740	9,495	4,550
25.....	9,265	23,155	7,540	10,568	8,256	26,612	27,824	29,588	26,804	24,452	9,054	4,588
26.....	9,350	24,310	7,420	10,304	8,508	25,820	27,212	28,868	26,780	24,260	8,571	4,645
27.....	9,245	25,150	7,140	9,864	9,348	24,956	27,236	28,388	26,756	23,396	8,214	6,820
28.....	9,160	25,845	6,860	9,474	9,732	23,396	26,996	27,884	26,660	22,724	7,668	7,420
29.....	8,215	26,060	6,660	9,159	.....	22,724	26,564	27,572	26,660	22,388	7,200	7,962
30.....	8,590	25,795	6,500	8,865	.....	22,148	25,844	27,452	26,780	21,956	6,780	8,424
31.....	4,425	.....	6,500	8,550	.....	21,284	.....	27,716	.....	21,380	6,180	.....

CLE ELUM RIVER NEAR ROSLYN, WASH.

LOCATION.—In sec. 10, T. 20 N., R. 14 E., 500 feet below temporary dam at outlet of Cle Elum Lake, and 4 miles northwest of Roslyn, about 7½ miles northwest of Cle Elum.

DRAINAGE AREA.—202 square miles.

RECORDS AVAILABLE.—October 10, 1903, to September 30, 1914.

¹ Gage height 1.6 referred to gage No. 2, estimated from approximate relation determined for gage height on lake and river. U. S. Geol. Survey Water-Supply Paper 252, p. 162.

GAGE.—Stevens water-stage recorder on left bank referred to inclined and vertical staff.

DISCHARGE MEASUREMENTS.—Made from cable 350 feet below gage or by wading; conditions excellent since August, 1908, when cable was relocated.

CHANNEL AND CONTROL.—Gravel and boulders; shifting slightly during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.50 feet at 6.35 a. m. May 16 (discharge, 4,050 second-feet); minimum stage, zero on gage, at 6 p. m. September 28 (discharge, practically zero).

1903-1914: Maximum stage recorded, 14.05 feet at 2 p. m. November 15, 1906 (discharge, 18,700 second-feet); minimum stage recorded, zero at 6 p. m. September 28, 1914 (discharge, practically zero).

WINTER FLOW.—Discharge relation not affected by ice.

REGULATION.—Flow regulated by storage and release of water at Cle Elum Lake reservoir. Computations of monthly discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Cle Elum River near Roslyn, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 2	R. K. Ray.....	1.73	255	June 12	F. E. Moxley.....	3.37	1,030
14	O. S. Reed.....	2.77	665	July 30	W. Bloomsburg.....	2.59	583
Nov. 26	Parker and Taylor.....	1.22	139	Aug. 19	.....do.....	2.50	522
Apr. 15	F. E. Moxley.....	5.09	2,420	Sept. 29	F. E. Moxley.....	.82	762
May 20	.....do.....	5.22	2,530				

Daily discharge, in second-feet, of Cle Elum River near Roslyn, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	255	514	670	256	433	69	820	1,630	2,060	1,180	580	394
2.....	255	493	720	256	413	72	820	1,880	2,750	1,320	580	356
3.....	241	453	720	256	394	75	820	2,860	3,080	1,390	580	337
4.....	241	433	720	256	394	76	770	3,190	2,640	1,390	558	302
5.....	228	433	770	286	375	77	820	2,750	2,060	1,320	535	286
6.....	228	433	770	375	356	80	820	2,330	1,710	1,180	535	270
7.....	241	433	770	558	337	83	820	2,150	1,390	1,060	535	256
8.....	241	433	770	720	337	84	930	2,150	1,180	1,000	535	241
9.....	228	413	770	770	320	86	1,220	1,970	1,060	945	535	241
10.....	241	375	770	770	320	89	1,630	1,970	1,000	945	535	228
11.....	255	413	770	820	302	92	1,880	2,060	1,000	890	535	215
12.....	413	413	820	820	286	94	2,060	2,240	1,060	890	535	203
13.....	535	394	770	770	286	96	2,150	2,640	1,250	890	535	191
14.....	670	178	720	770	270	98	2,150	3,080	1,470	890	535	191
15.....	670	61	720	770	270	163	2,430	3,670	1,790	890	535	191
16.....	670	66	670	720	256	215	2,530	3,920	2,060	835	535	191
17.....	670	80	625	720	256	337	1,970	3,430	2,330	835	535	191
18.....	670	91	580	720	241	535	1,880	2,970	2,330	783	535	191
19.....	625	97	535	670	241	875	2,060	2,640	2,150	733	493	203
20.....	625	98	514	625	228	875	2,530	2,530	1,970	733	453	215
21.....	670	101	473	625	112	985	2,530	2,640	1,630	683	453	228
22.....	670	103	433	625	56	1,100	2,150	2,860	1,470	683	453	256
23.....	625	108	413	602	57	1,100	1,880	2,970	1,180	733	453	256
24.....	625	114	375	580	59	1,100	1,710	2,970	1,120	733	453	256
25.....	625	121	356	558	61	1,160	1,630	2,750	1,180	733	453	256
26.....	670	135	337	535	64	1,160	1,630	2,330	1,120	733	433	241
27.....	625	286	302	514	64	1,100	1,550	1,970	1,120	683	413	87
28.....	625	514	302	493	69	985	1,550	1,710	1,060	580	413	26
29.....	602	720	302	473	.....	930	1,550	1,550	1,060	580	413	74
30.....	557	770	270	453	.....	875	1,630	1,470	1,120	580	413	87
31.....	535	.....	270	453	.....	875	.....	1,630	.....	580	394	.....

NOTE.—Discharge determined from two well-defined rating curves; one applicable Oct. 1 to Apr. 9 and July 28 to Sept. 26; the other applicable Apr. 10 to July 27 and Sept. 27-30.

Monthly discharge of Cle Elum River near Roslyn, Wash., for year ending Sept. 30, 1914.

[Drainage area, 202 square miles.^a]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge with- out storage (second-feet).		Run-off (depth in inches on drain- age area).	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored.	Without storage.	Mean.	Per square mile.		
October.....	670	228	485	29,800	+ 3,000	32,800	533	2.64	3.04	A.
November.....	770	61	309	18,400	+17,400	35,800	602	2.98	3.32	A.
December.....	820	270	581	35,700	-19,300	16,400	267	1.32	1.52	A.
January.....	820	256	575	35,400	+ 2,050	37,400	608	3.01	3.47	A.
February.....	433	56	245	13,600	+ 1,180	14,800	266	1.32	1.38	A.
March.....	1,160	69	501	30,800	+11,600	42,400	690	3.42	3.94	A.
April.....	2,530	770	1,630	97,000	+ 4,560	102,000	1,720	8.52	9.51	A.
May.....	3,920	1,470	2,480	152,000	+ 1,870	154,000	2,510	12.4	14.30	A.
June.....	3,080	1,000	1,610	96,000	- 936	95,000	1,600	7.92	8.84	A.
July.....	1,390	580	884	54,300	- 5,400	48,900	795	3.94	4.54	A.
August.....	580	394	499	30,700	-15,200	15,500	252	1.25	1.44	A.
September.....	394	26	222	13,200	+ 2,240	15,400	259	1.28	1.43	A.
The year.	3,920	26	839	607,000	+ 3,060	610,000	844	4.18	56.73	

^a Revised value.

TEANAWAY RIVER NEAR CLE ELUM, WASH.

LOCATION.—In the NW. $\frac{1}{4}$ sec. 3, T. 19 N., R. 16 E., at lower Teanaway highway bridge, about one-half mile above mouth and $4\frac{1}{2}$ miles east of Cle Elum.

DRAINAGE AREA.—205 square miles.

RECORDS AVAILABLE.—April 2, 1909, to October 15, 1911; May 21, 1912, to September 30, 1914.

GAGE.—Chain gage attached to guard rail of highway bridge.

DISCHARGE MEASUREMENTS.—Made by wading or from downstream guard rail of highway bridge; conditions at high stages very poor.

CHANNEL AND CONTROL.—Bed clay and gravel; shifts greatly at high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.45 feet at 8.25 a. m. April 15 (discharge, 1,460 second-feet); minimum stage recorded, 2.17 feet at 2 p. m. August 6 (discharge, 1 second-foot).

1909-1914: Maximum stage recorded, 7.20 feet March 20, 1910 (discharge, 4,030 second-feet); minimum stage recorded, 2.17 feet at 2 p. m. August 6, 1914 (discharge, 1 second-foot).

WINTER FLOW.—Discharge relations affected by ice and logs; discharge for winter months is generally estimated by comparison with records of streams on adjacent drainage basins and is subject to error.

REGULATION.—Flow affected by storage and release of water by Cascade Lumber Co. in its splash dams on forks of river 20 miles above gage.

DIVERSIONS.—Below all diversions for irrigation; 3 ditches divert water entirely out of Teanaway Valley and their return water does not pass station.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Teanaway River near Cle Elum, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 1	R. K. Ray.....	2.42	15.3	July 31	Bloomsburg and Mox- ley.....	2.36	12.1
15	O. S. Reed.....	3.08	97.9				
Apr. 16	F. E. Moxley.....	5.21	1,250	Aug. 20	W. Bloomsburg.....	2.27	2.31
May 21	.....do.....	4.41	656	Sept. 30	F. E. Moxley.....	2.54	21.8
June 11	.....do.....	3.45	210				

Daily discharge, in second-feet, of Teanaway River near Cle Elum, Wash., for the year ending Sept. 30, 1914.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	15	54	144	51	90	304	403	745	505	144	8	8
2.....	15	53	126	69	74	312	385	1,230	620	144	2	7
3.....	15	48	124	54	67	279	582	1,410	560	120	3	7
4.....	16	47	126	54	96	265	780	1,070	455	125	3	7
5.....	16	54	110	99	125	248	1,230	745	362	120	2	8
6.....	15	85	110	588	74	248	1,320	710	320	107	1	8
7.....	23	81	104	642	134	265	1,320	680	300	69	6	9
8.....	28	68	97	642	125	340	1,320	650	258	64	7	9
9.....	34	64	91	425	94	480	1,230	590	215	64	6	10
10.....	28	61	83	376	102	530	1,230	620	209	64	5	10
11.....	54	56	85	312	88	455	1,410	680	212	54	4	11
12.....	136	80	83	265	92	480	1,320	680	215	47	4	11
13.....	112	77	75	234	88	480	1,230	815	254	50	6	11
14.....	117	60	74	230	88	745	1,320	1,030	272	67	5	10
15.....	102	69	75	206	82	1,030	1,410	1,230	312	49	2	7
16.....	99	81	72	200	82	955	1,230	1,070	328	40	4	6
17.....	85	205	72	170	88	1,230	1,150	815	320	44	3	8
18.....	81	186	68	167	84	1,320	990	680	340	41	5	11
19.....	91	163	67	139	90	1,230	1,230	650	300	23	5	14
20.....	97	149	62	144	90	1,230	1,410	650	209	21	5	19
21.....	93	149	69	144	102	1,230	955	680	190	21	4	20
22.....	86	122	52	147	125	1,070	850	710	170	18	1	20
23.....	78	115	54	105	127	1,070	745	710	147	18	5	19
24.....	75	128	57	107	144	920	710	665	157	18	6	20
25.....	71	128	61	94	139	780	680	620	212	15	5	18
26.....	67	131	53	122	144	620	680	455	179	15	7	21
27.....	68	177	56	107	265	560	650	430	185	12	4	27
28.....	61	174	43	111	300	455	560	385	171	12	4	26
29.....	60	183	60	113	.....	412	545	320	157	18	5	23
30.....	60	186	53	116	.....	407	530	328	149	13	6	21
31.....	54	.....	53	107	.....	417	.....	407	.....	13	5	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Jan. 8, and Jan. 9 to Sept. 30. Discharge interpolated, owing to lack of gage readings, Oct. 4; Feb. 4; Apr. 3 and 29; May 24; June 21 and 28; Aug. 1, 5, and 11.

Monthly discharge of Teanaway River near Cle Elum, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	136	15	63	3,870	B.
November.....	205	47	108	6,420	B.
December.....	144	43	79	4,880	B.
January.....	642	51	204	12,500	B.
February.....	300	67	114	6,350	B.
March.....	1,320	248	657	40,400	B.
April.....	1,410	385	980	58,300	B.
May.....	1,410	320	725	44,500	B.
June.....	620	147	276	16,400	B.
July.....	144	12	53	3,230	B.
August.....	8	1	4	274	C.
September.....	27	6	14	805	C.
The year.....	1,410	1	274	198,000	

MANASTASH CREEK NEAR ELLENSBURG, WASH.

LOCATION.—In sec. 15, T. 17 N., R. 17 E., at a private bridge on Sackett's ranch, 1½ miles above mouth of Manastash Canyon and 2 miles below the North Fork, 8½ miles west of Ellensburg.

DRAINAGE AREA.—76 square miles.

RECORDS AVAILABLE.—April 5, 1909, to September 30, 1914.

GAGE.—Vertical staff on left bank, 35 feet below bridge.

DISCHARGE MEASUREMENTS.—Made from the bridge or by wading.

CHANNEL AND CONTROL.—Rock and gravel; permanent except in extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.58 feet at 7.50 a. m. May 15 (discharge, 285 second-feet); minimum stage recorded, 1.20 feet at 8.40 a. m. December 10 (discharge, 7 second-feet). Maximum stage for the year differs from that recorded in daily discharge table, because gage heights were used to tenths of feet in computing those discharges.

1909-1914: Maximum stage recorded, 3.66 feet March 20, 1910 (discharge, 682 second-feet); minimum stage recorded, 1.19 feet August 27 and 28, 1913 (discharge, 6 second-feet).

WINTER FLOW.—Discharge relation affected by ice; winter estimates subject to error.

DIVERSIONS.—No important diversions above gage.

REGULATION.—A few hundred acre-feet of storage has been developed in Manastash Lake, and water is released for use in irrigating a second crop of alfalfa.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Manastash Creek near Ellensburg, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Apr. 18	F. E. Moxley.....	2.24	186	Aug. 12	Bloomsburg and Moxley	1.31	13.0
May 22	.....do.....	2.22	166	27	W. Bloomsburg.....	1.28	10.1
June 9	.....do.....	1.85	80.2				

Daily discharge, in second-feet, of Manastash Creek near Ellensburg, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	11	16	16	13	30	38	56	126	115	42	18	9
2.....	11	14	13	13	14	34	56	157	113	41	17	10
3.....	10	14	13	13	55	36	65	222	108	40	18	10
4.....	10	15	16	19	24	38	83	204	108	37	17	9
5.....	10	16	15	25	32	41	108	172	100	37	16	9
6.....	10	18	16	32	56	43	131	172	94	36	15	9
7.....	14	17	13	38	44	62	152	154	92	34	15	11
8.....	15	17	14	36	32	65	204	152	86	30	15	11
9.....	14	17	14	26	56	88	204	152	85	29	16	11
10.....	14	17	7	32	20	78	222	157	78	29	17	11
11.....	16	17	12	28	17	98	240	157	73	28	16	11
12.....	16	16	13	28	17	98	222	157	71	28	14	11
13.....	18	14	13	28	14	94	222	172	71	30	13	11
14.....	17	14	13	27	14	108	240	204	70	28	13	11
15.....	16	14	12	24	14	126	240	292	68	27	12	13
16.....	16	14	10	24	13	120	222	257	66	26	12	12
17.....	16	15	13	23	13	152	187	222	66	25	13	15
18.....	16	16	13	22	16	172	172	204	64	24	13	17
19.....	20	16	12	18	16	157	187	187	64	24	12	14
20.....	18	16	10	18	16	154	187	187	59	24	12	12
21.....	16	13	9	21	23	144	172	187	58	24	12	13
22.....	16	13	11	20	24	136	157	172	60	24	12	12
23.....	16	16	9	20	26	134	157	187	59	23	11	11
24.....	17	16	13	20	27	131	149	187	60	23	11	11
25.....	17	15	13	21	30	113	144	172	59	22	11	11
26.....	17	16	14	21	29	108	134	157	55	21	11	14
27.....	17	17	14	21	31	88	131	141	52	21	11	17
28.....	17	13	13	24	32	80	124	126	50	21	10	15
29.....	16	16	13	19	.....	71	120	120	46	19	10	14
30.....	15	16	12	19	.....	68	113	113	43	19	10	12
31.....	15	.....	13	19	.....	62	.....	108	.....	18	9	.....

NOTE.—Discharge determined from two fairly well-defined rating curves applicable Oct. 1 to May 15 and May 16 to Sept. 30. Discharge interpolated, owing to lack of gage readings, Jan. 5, 6, 17, and 23-26; Aug. 5, 22, and 30. Discharge interpolated on account of ice, Feb. 7.

Monthly discharge of Manastash Creek near Ellensburg, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	20	10	15.1	928	B.
November.....	18	13	15.5	922	B.
December.....	16	7	12.6	775	B.
January.....	38	13	23.0	1,410	B.
February.....	56	13	26.2	1,460	B.
March.....	172	34	94.7	5,820	B.
April.....	240	56	160	9,520	B.
May.....	292	108	173	10,600	B.
June.....	115	43	73.1	4,350	B.
July.....	42	18	27.5	1,690	B.
August.....	18	9	13.3	818	B.
September.....	17	9	11.9	708	B.
The year.....	292	7	54.0	39,000	

NACHES RIVER AT ANDERSON'S RANCH, NEAR NILE, WASH.

LOCATION.—In sec. 35, T. 17 N., R. 14 E., at Anderson's ranch, about one-half mile below mouth of Lost Creek, 7 miles below Bumping River, and 11 miles above Nile.

DRAINAGE AREA.—394 square miles.

RECORDS AVAILABLE.—April 24, 1909, to September 30, 1914.

GAGE.—Vertical staff attached to tree on left bank.

DISCHARGE MEASUREMENTS.—Made from cable 150 feet above gage or by wading.

CHANNEL AND CONTROL.—Composed of gravel and cobblestones which shift at high stages; flow controlled by riffle 300 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.10 feet at 8 a. m. June 3 (discharge, 3,050 second-feet); minimum stage recorded, 0.98 foot December 31 and January 1 (discharge, 156 second-feet).

1909–1914: Maximum stage recorded, 6.0 feet November 24, 1909 (discharge, 9,500 second-feet); minimum stage recorded, 0.90 foot October 8–26, 1911, and November 1–5, 1912 (discharge, 120 second-feet).

WINTER FLOW.—Discharge relation affected by ice jams on control. Winter discharge estimated by comparison with records on Naches River at Oak Flat.

DIVERSIONS.—Anderson's ditch diverts a small quantity of water past the gage during the irrigating season.

REGULATION.—Flow partly regulated by storage and release of water at Bumping Lake reservoir. Computations of discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Naches River at Anderson's ranch, near Nile, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.
Dec. 3	Taylor and Parker.....	<i>Feet.</i> 1.40	<i>Sec.-ft.</i> 409
May 15	F. E. Moxley.....	2.98	2,680

Daily discharge, in second-feet, of Naches River at Anderson's ranch, near Nile, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	233	327	500	156	400	400	800	1,890	2,100	1,220	620	384
2.....	233	327	440	180	362	620	855	2,330	2,570	1,220	602	384
3.....	233	320	400	175	263	572	910	2,810	3,050	1,220	602	384
4.....	233	294	400	156	400	527	1,140	2,810	2,600	1,220	602	384
5.....	233	320	392	800	295	509	1,480	2,690	2,000	1,080	602	384
6.....	233	400	362	1,890	295	483	1,630	2,570	1,740	950	602	384
7.....	263	362	362	2,810	362	527	1,630	2,570	1,660	950	602	384
8.....	263	327	362	2,570	327	572	1,710	2,450	1,580	830	530	384
9.....	233	327	362	2,100	327	620	1,800	1,710	1,360	830	530	384
10.....	233	362	340	1,890	362	690	2,000	1,630	1,220	775	530	384
11.....	294	378	314	1,550	295	690	2,330	1,630	1,220	720	530	384
12.....	362	362	294	1,410	295	690	2,330	1,710	1,290	720	512	360
13.....	400	348	294	1,340	295	745	2,330	2,000	1,440	830	512	360
14.....	440	327	294	1,200	295	745	2,450	2,330	1,580	720	512	360
15.....	392	327	294	1,140	327	965	2,810	2,690	1,820	620	512	424
16.....	362	327	294	1,020	314	965	2,810	2,690	2,110	602	530	424
17.....	340	400	294	1,020	263	1,270	2,690	2,330	2,470	512	512	424
18.....	340	400	294	910	281	1,480	2,570	2,100	2,220	712	467	512
19.....	392	400	294	800	275	1,550	2,570	1,890	2,000	512	467	830
20.....	385	400	294	690	263	1,630	2,810	1,890	1,910	494	467	830
21.....	400	400	233	620	295	1,630	2,810	2,000	1,740	467	467	650
22.....	400	400	205	745	307	1,630	2,570	2,000	1,360	384	440	467
23.....	400	385	200	690	307	1,550	2,330	2,100	1,220	440	467	416
24.....	400	392	195	620	295	1,480	2,220	2,000	1,150	384	467	384
25.....	483	545	185	572	314	1,340	2,000	1,890	1,290	384	424	346
26.....	400	527	180	572	295	1,270	1,890	1,710	1,290	384	424	424
27.....	400	572	175	483	251	1,200	1,890	1,890	1,220	424	408	384
28.....	392	554	170	527	327	1,020	1,710	2,000	1,150	440	408	346
29.....	362	527	165	483	.....	1,020	1,630	1,710	1,150	512	424	311
30.....	340	518	160	483	.....	910	1,710	1,630	1,220	602	392	311
31.....	340	.....	156	483	.....	855	.....	1,710	.....	602	392	.....

NOTE.—Discharge determined from two rating curves well defined below 4,000 second-feet, applicable Oct. 1 to June 3 and June 4 to Sept. 30. Discharge relation probably affected by ice and discharge interpolated Dec. 23-30. Discharge relation possibly slightly affected by ice at times during January and February.

Monthly discharge of Naches River at Anderson's ranch, near Nile, Wash., for year ending Sept. 30, 1914.

[Drainage area, 394 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge with- out storage (second-feet).		Run-off (depth in inches on drain- age area).	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored.	Without storage.	Mean.	Per square mile.		
October.....	483	233	336	20,700	— 265	20,400	332	0.843	0.97	A.
November.....	572	294	395	23,500	+ 575	24,100	405	1.03	1.15	A.
December.....	500	156	287	17,700	— 870	16,800	273	.693	.80	B.
January.....	2,810	156	970	59,700	+ 545	60,200	979	2.49	2.87	B.
February.....	400	251	310	17,200	— 613	16,600	299	.759	.79	B.
March.....	1,630	400	973	59,800	+ 168	60,000	976	2.48	2.86	A.
April.....	2,810	800	2,010	120,000	+ 1,890	122,000	2,050	5.20	5.80	B.
May.....	2,810	1,630	2,110	130,000	+ 29,900	160,000	2,600	6.60	7.61	B.
June.....	3,050	1,150	1,690	101,000	— 494	101,000	1,700	4.31	4.81	A.
July.....	1,220	384	696	42,800	— 3,380	39,400	641	1.63	1.88	A.
August.....	1,220	392	502	30,900	— 16,400	14,500	236	.599	.69	A.
September.....	830	311	426	25,400	— 11,900	13,500	227	.576	.64	A.
The year..	3,050	156	895	648,000	— 844	648,000	896	2.27	30.87	

NACHES RIVER AT OAK FLAT, NEAR NILE, WASH.

LOCATION.—In sec. 34, T. 15 N., R. 16 E., just above Oak Flat, three-fourths mile above intake of Selah Valley canal, 2 miles above mouth of Tieton River, and 8 miles southeast of Nile.

DRAINAGE AREA.—640 square miles.

RECORDS AVAILABLE.—June 25, 1904, to September 30, 1914.

GAGE.—Prior to September 15, Barrett & Lawrence water-stage recorder installed September 20, 1911, referred to chain gage on cantilever beam used since April 13, 1909. After September 19 chain gage replaced by inclined staff. Original gage was an inclined staff 800 feet below present site.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet below gage; conditions good except at extreme low stages, when measurements are made by wading.

CHANNEL AND CONTROL.—Stream bed composed of small cobblestones; shifts considerably at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from water-stage recorder sheets, 7 feet at 8.45 p. m. May 15 (discharge, 3,910 second-feet); minimum stage, from water-stage recorder sheets, 3.65 feet at 10.30 a. m. January 3 (discharge, 241 second-feet).

1904-1914: Maximum stage recorded, 10.3 feet November 15, 1906 (discharge 21,900 second-feet); minimum stage recorded, 3 feet September 18-21, 1904 (discharge, 139 second-feet).¹

WINTER FLOW.—Discharge relation affected by anchor ice; records of doubtful accuracy.

DIVERSIONS.—None of importance above station.

REGULATION.—Flow partly regulated by storage and release of water at Bumping Lake reservoir. Computations of monthly discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Naches River at Oak Flat, near Nile, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 20	Reed and Moxley	4.17	514	May 15	F. E. Moxley	6.89	3,060
Nov. 15	Do.	4.00	402	May 28	Do.	6.04	2,510
Dec. 2	Parker and Taylor	4.22	506	June 2	Do.	6.73	2,380
11	F. E. Moxley	3.98	377	Sept. 4	Moxley and Taylor	4.08	452
Jan. 6	Do.	6.25	2,600	22	F. E. Moxley	4.58	525
May 1	Do.	6.08	2,260				

¹ Gage height very unreliable. Actual discharge for these dates was probably more nearly 180 second-feet than 139 second-feet. If this assumption is correct, the minimum stage recorded 1904-1914 was 3.37 feet October 19, 1911 (discharge, 154 second-feet).

Daily discharge, in second-feet, of Naches River at Oak Flat, near Nile, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	322	415	549	252	493	521	1,080	2,290	2,580	1,440	639	440
2	322	415	521	268	493	670	1,030	2,910	3,280	1,490	639	415
3	300	390	493	241	385	810	1,080	3,690	3,690	1,490	639	415
4	300	390	466	260	549	670	1,440	3,480	3,090	1,440	608	415
5	300	390	466	1,130	415	670	1,820	3,090	2,430	1,260	608	440
6	280	466	440	2,290	339	639	2,040	2,910	2,160	1,180	608	415
7	322	466	415	3,090	466	705	2,100	3,090	1,930	1,080	639	440
8	322	440	415	2,910	440	810	2,160	2,740	1,760	1,030	608	415
9	322	440	415	2,290	390	980	2,430	2,160	1,660	980	579	440
10	322	466	367	1,980	390	935	2,430	2,160	1,490	890	579	440
11	343	493	367	1,820	440	890	2,740	2,160	1,490	810	579	466
12	466	466	367	1,600	381	890	2,740	2,290	1,490	810	549	670
13	440	440	367	1,540	381	980	2,740	2,580	1,710	935	549	670
14	549	440	367	1,380	367	1,180	3,090	3,090	1,820	850	549	670
15	493	415	367	1,330	381	1,380	3,480	3,910	2,100	775	549	641
16	493	415	322	1,230	381	1,330	3,480	3,480	2,290	705	549	612
17	440	466	322	1,130	376	1,710	3,090	3,290	2,500	670	549	584
18	415	493	300	1,030	367	1,930	2,910	2,910	2,430	639	493	555
19	466	493	300	890	367	2,040	3,090	2,550	2,290	608	493	526
20	466	493	300	890	343	2,100	3,090	2,550	2,040	579	493	498
21	466	493	322	810	381	2,100	3,280	2,550	1,820	549	493	498
22	466	440	300	775	390	2,040	3,090	2,740	1,600	493	493	525
23	493	466	300	775	390	1,980	2,740	2,740	1,440	466	493	470
24	493	549	280	705	390	1,930	2,580	2,740	1,380	440	466	470
25	549	608	260	705	415	1,760	2,430	2,550	1,540	466	466	444
26	493	608	260	670	415	1,600	2,430	2,430	1,490	521	466	460
27	493	608	260	608	390	1,490	2,280	2,430	1,440	549	440	460
28	466	608	280	521	466	1,380	2,160	2,290	1,380	639	440	418
29	440	608	280	579	-----	1,280	2,100	2,160	1,330	670	440	369
30	415	608	260	549	-----	1,180	2,040	2,100	1,380	670	440	498
31	415	-----	260	521	-----	1,130	-----	2,160	-----	639	440	-----

NOTE.—Discharge determined as follows: Oct. 1 to Sept. 14 from a rating curve well defined between 250 and 5,000 second-feet; Sept. 15-30 from a fairly well defined rating curve. Discharge interpolated, owing to destruction of gage, Sept. 15-19.

Monthly discharge of Naches River at Oak Flat, near Nile, Wash., for the year ending Sept. 30, 1914.

[Drainage area, 640 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy of observed discharge.
	Maxi-mum.	Mini-mum.	Mean.	Obs-erved.	Stored.	Without storage.	Mean.	Per square mile.		
October	549	280	415	25,500	— 265	25,200	410	0.641	0.74	B.
November	608	390	483	28,700	+ 575	29,300	492	.769	.86	A.
December	549	260	354	21,800	— 870	20,900	340	.531	.61	A.
January	3,090	241	1,120	68,900	+ 545	69,400	1,130	1.77	2.04	A.
February	549	339	407	22,600	— 613	22,000	396	.619	.64	A.
March	2,100	521	1,280	78,800	+ 168	79,000	1,280	2.00	2.31	A.
April	3,690	1,030	2,460	146,000	+ 1,890	148,000	2,490	3.89	4.34	A.
May	3,910	2,100	2,720	167,000	+29,900	197,000	3,200	5.00	5.76	A.
June	3,690	1,330	1,970	117,000	— 494	117,000	1,970	3.08	3.44	A.
July	1,490	440	832	51,200	— 3,380	47,800	777	1.21	1.40	A.
August	639	440	535	32,900	—16,400	16,500	268	.419	.48	A.
September	670	369	493	29,300	—11,900	17,400	292	.456	.51	B.
The year	3,910	241	1,090	790,000	— 844	790,000	1,090	1.70	23.13	

BUMPING LAKE NEAR NILE, WASH.

LOCATION.—At lake outlet 12 miles above American River and 19 miles west of Nile.

DRAINAGE AREA.—68 square miles.

RECORDS AVAILABLE.—April 27 to November 22, 1909; November 3, 1910, to September 30, 1914.

GAGE.—Stenciled on side of gatehouse; graduated to read elevations above sea level.

Prior to November 3, 1910, a vertical staff on north shore one-fourth mile above outlet.

EXTREMES OF STAGE.—Maximum stage recorded during year, 127.55 feet at 7.20 a. m. June 3; minimum stage recorded, 93.10 feet at 7.40 a. m. February 26.

1911-1914: Maximum stage recorded, 127.78 feet June 14, 1913; minimum stage recorded, 92.50 feet March 7, 1911. Add 3,300 feet to gage heights to obtain mean sea level elevation.

REGULATION.—Storage regulated by operation of gates in dam.

COOPERATION.—Records furnished by the United States Reclamation Service.

Daily capacity, in acre-feet, of Bumping Lake near Nile, Wash., for the year ending Sept. 30, 1914.

[J. H. Nelson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	1,940	1,750	2,272	1,480	1,940	1,600	1,540	3,400	33,555	32,840	28,875	12,600
2.	1,850	1,750	2,200	1,468	1,850	1,548	1,520	3,645	33,750	32,905	28,290	12,100
3.	1,775	1,725	2,140	1,480	1,825	1,500	1,480	4,114	33,776	32,840	27,780	11,628
4.	1,692	1,700	2,060	1,520	1,790	1,412	1,440	4,450	33,594	32,840	27,180	11,178
5.	1,628	1,700	2,025	2,308	1,750	1,340	1,532	4,646	33,334	32,775	26,580	10,710
6.	1,580	1,775	1,960	4,744	1,692	1,300	1,588	4,744	33,165	32,710	26,100	10,260
7.	1,580	1,775	1,950	7,104	1,652	1,283	1,652	4,840	33,035	32,584	25,240	9,810
8.	1,532	1,760	1,890	8,145	1,640	1,265	1,710	5,080	32,970	32,645	24,756	9,342
9.	1,500	1,790	1,850	8,262	1,620	1,248	1,810	6,280	32,905	32,645	24,245	8,838
10.	1,480	1,850	1,825	8,802	1,600	1,230	1,960	7,425	32,840	32,580	23,695	8,370
11.	1,492	1,875	1,790	7,425	1,560	1,230	2,100	8,775	32,840	32,580	23,200	7,920
12.	1,580	1,860	1,760	7,080	1,540	1,230	2,290	10,125	32,905	32,580	22,650	7,515
13.	1,668	1,840	1,750	6,624	1,500	1,237	2,500	11,565	32,996	32,645	22,100	7,120
14.	1,825	1,825	1,750	6,064	1,492	1,308	2,890	13,450	33,100	32,580	21,572	6,680
15.	1,860	1,825	1,740	5,536	1,428	1,360	3,456	15,600	33,230	32,515	21,022	6,304
16.	1,825	1,850	1,700	4,880	1,372	1,420	3,890	17,420	33,360	32,515	20,428	5,920
17.	1,800	1,925	1,660	4,394	1,308	1,468	4,135	19,405	33,490	32,450	19,790	5,520
18.	1,775	2,025	1,640	3,960	1,265	1,548	4,226	21,055	33,490	32,450	19,295	5,184
19.	1,775	2,050	1,620	3,610	1,223	1,640	4,394	22,485	33,360	32,450	18,800	4,436
20.	1,775	2,050	1,580	3,370	1,178	1,740	4,786	23,915	33,230	32,450	18,305	3,806
21.	1,825	2,050	1,560	3,160	1,143	1,840	4,944	25,500	33,100	32,585	17,755	3,172
22.	1,825	2,075	1,540	3,052	1,125	1,910	4,960	27,000	32,970	32,585	17,300	2,830
23.	1,850	2,110	1,532	2,872	1,108	1,975	4,864	28,680	32,866	32,585	16,800	2,488
24.	1,850	2,212	1,520	2,728	1,090	2,025	4,674	30,396	32,905	32,520	16,400	2,175
25.	1,875	2,290	1,508	2,548	1,020	2,050	4,485	31,930	32,970	32,255	15,900	1,900
26.	1,875	2,350	1,500	2,410	1,090	1,960	4,324	32,944	32,905	32,034	15,450	1,692
27.	1,900	2,380	1,500	2,308	1,308	1,860	4,205	33,220	32,840	31,670	15,000	1,548
28.	1,875	2,380	1,500	2,175	1,412	1,760	3,960	33,165	32,840	31,176	14,520	1,400
29.	1,825	2,380	1,492	2,125	.....	1,692	3,666	33,165	32,840	30,656	14,100	1,255
30.	1,800	2,350	1,492	2,075	.....	1,620	3,470	33,204	32,840	30,045	13,600	1,188
31.	1,775	.....	1,480	2,025	.....	1,580	.....	33,334	.....	29,460	13,100	.....

BUMPING RIVER NEAR NILE, WASH.

LOCATION.—One-fourth mile below spillway of Bumping Lake dam, half a mile below outlet conduit of Bumping Lake reservoir, 11½ miles above American River and 19 miles west of Nile.

DRAINAGE AREA.—68 square miles.

RECORDS AVAILABLE.—June 13 to July 31, 1906; April 27, 1909, to September 30, 1914.

GAGE.—Stevens water-stage recorder installed June 17, 1913. A gage at the dam site was read June 13 to July 31, 1906. A gage at the bridge 450 feet below dam site was read April 27 to August 6, 1909, but published readings were transferred to a gage 1,200 feet below the dam, 100 feet below the spillway, which was read August 7, 1909, to June 24, 1912. The gage at the bridge was again read June 25, 1912, to June 13, 1913.

DISCHARGE MEASUREMENTS.—Made from cable; when water is not passing through the spillway or when stage is low, measurements can be made at outlet conduit or by wading.

CHANNEL AND CONTROL.—Bowlders and cobblestones; shifts slightly at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.32 feet at 6.15 a. m. June 3 (discharge, 1,050 second-feet); minimum stage, 1.11 feet February 27–28 (discharge, practically zero).

1906 and 1909–1914: Maximum stage recorded, 7.0 feet, November 15, 1906 (discharge, approximately 4,300 second-feet); minimum flow practically zero when gates in dam are closed.

WINTER FLOW.—Discharge relation not affected by ice.

REGULATION.—Flow regulated to a considerable extent by storage and release of water at Bumping Lake reservoir. Estimates of monthly discharge corrected for effect of storage.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Bumping River near Nile, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
June 29	F. E. Moxley.....	3.00	372
30	.....do.....	3.06	411

Daily Discharge, in second-feet, of Bumping River near Nile, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	169	169	245	108	180	21	228	485	814	418	418	336
2.....	156	169	228	100	164	206	228	508	1,010	418	440	336
3.....	146	164	228	97	162	194	228	606	1,010	418	440	336
4.....	146	159	212	106	154	183	197	581	868	397	440	336
5.....	146	162	212	245	146	172	245	581	682	356	440	336
6.....	149	175	197	508	149	166	262	606	556	317	440	317
7.....	140	177	197	708	142	159	262	606	485	298	440	336
8.....	133	177	183	787	129	154	280	197	440	298	440	317
9.....	126	180	183	787	129	154	317	26	397	262	418	336
10.....	126	191	169	787	122	154	317	24	376	245	418	336
11.....	126	197	169	760	120	149	356	24	397	228	418	317
12.....	140	197	169	656	118	146	376	24	397	245	418	298
13.....	159	191	156	734	120	154	397	27	418	262	418	298
14.....	166	183	156	682	137	164	440	33	532	245	418	298
15.....	183	180	156	631	149	180	508	39	606	212	418	317
16.....	177	183	144	581	144	191	532	42	708	191	418	317
17.....	175	191	144	532	131	197	556	39	787	180	418	317
18.....	172	212	144	485	122	212	581	37	734	172	376	508
19.....	172	212	144	462	110	228	581	36	682	166	376	581
20.....	172	212	144	418	116	245	606	33	631	166	356	532
21.....	175	212	140	376	118	245	606	35	508	135	356	418
22.....	177	212	135	356	112	298	631	39	440	131	376	298
23.....	183	228	133	336	108	298	606	40	376	126	356	317
24.....	183	228	131	280	108	298	581	42	418	212	356	298
25.....	191	245	131	298	102	298	581	50	418	262	336	280
26.....	180	245	126	280	29	298	581	462	397	298	356	262
27.....	180	245	126	262	0	280	556	581	397	280	356	245
28.....	186	245	124	228	0	262	532	581	376	440	336	197
29.....	180	245	122	212	.....	262	508	556	376	440	336	172
30.....	175	245	120	197	.....	245	508	556	397	440	336	154
31.....	172	.....	118	197	.....	245	.....	656	.....	440	356	.....

NOTE.—Discharge determined from a rating curve well defined between 100 and 1,100 second-feet.

Monthly discharge of Bumping River near Nile, Wash., for period ending Sept. 30, 1914.

[Drainage area, 68 square miles.]

Month	Observed discharge (second-foot)			Run-off (total in acre-feet).			Discharge without storage (second-foot).		Run-off (depth in inches on drain- age area.	Accu- racy of ob- served dis- charge.
	Maxi- mum.	Mini- mum.	Mean.	Ob- served.	Stored.	Without storage.	Mean.	Per square mile.		
October.....	191	126	163	10,000	— 265	9,740	158	2.32	2.68	A.
November.....	245	159	201	12,000	+ 575	12,600	212	3.12	3.48	A.
December.....	245	118	161	9,900	— 870	9,030	147	2.16	2.49	A.
January.....	787	97	426	26,200	+ 545	26,700	434	6.38	7.30	A.
February.....	180	0	119	6,610	— 613	6,000	108	1.59	1.66	B.
March.....	298	21	208	12,800	+ 168	13,000	211	3.10	3.57	A.
April.....	631	197	440	26,200	+ 1,890	28,100	472	6.94	7.74	A.
May.....	656	24	263	16,200	+ 29,900	46,100	750	11.0	12.68	A.
June.....	1,010	376	554	33,000	— 494	32,500	546	8.03	8.96	A.
July.....	440	126	281	17,300	— 3,380	13,900	226	3.32	3.53	A.
August.....	440	336	394	24,200	— 16,400	7,800	127	1.87	2.16	A.
September.....	581	154	325	19,300	— 11,900	7,400	124	1.82	2.03	A.
The year	1,010	0	295	214,000	— 844	213,000	294	4.32	58.64	

AMERICAN RIVER NEAR NILE, WASH.

LOCATION.—At highway bridge about three-fourths mile above mouth of river 17 miles northwest of Nile post office, and below all tributaries.

DRAINAGE AREA.—80 square miles.

RECORDS AVAILABLE.—April 25 to October 30, 1909; May 26 to November 15, 1910, May 18 to September 30, 1911; July 1 to September 30, 1913; June 26 to September 5, 1914.

GAGE.—Vertical staff attached to right abutment of highway bridge.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading. Section rough, velocity irregular, and current swift at all stages so that accurate measurements are difficult to obtain.

CHANNEL AND CONTROL.—Rough; full of large boulders; gradient steep; shifts slightly at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded June 26 to September 5, 3.03 feet July 3-4 (discharge, 462 second-foot); minimum stage recorded, 1.63 feet August 21 to September 5 (discharge, 48 second-foot).

1909-1911 and 1913-14: Maximum stage recorded¹ 4.55 feet, June 2, 1909 (discharge, 1,580 second-foot); Minimum stage recorded, 1.60 feet, October 16-19, 1909 (discharge, 45 second-foot).

WINTER FLOW.—Station has not been maintained during winter season.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of American River near Nile, Wash., during the year ending Sept. 30, 1914.

[Made by F. E. Moxley.]

Date.	Gage height.	Dis- charge.
June 26.....	Feet. 2.81	Sec.-ft. 367
July 1.....	3.01	450

¹ Records available for only a few months each summer.

Daily discharge, in second-feet, of American River near Nile, Wash., for the year ending Sept. 30, 1914.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1.....		451	95	48	16.....		205	61	.....
2.....		456	95	48	17.....		185	61	.....
3.....		462	95	48	18.....		185	61	.....
4.....		462	95	48	19.....		172	61	.....
5.....		415	89	48	20.....		160	54	.....
6.....		368	83	.....	21.....		160	48	.....
7.....		321	77	.....	22.....		152	48	.....
8.....		321	77	.....	23.....		144	48	.....
9.....		301	77	.....	24.....		136	48	.....
10.....		281	77	.....	25.....		114	48	.....
11.....		246	77	.....	26.....	355	114	48	.....
12.....		246	71	.....	27.....	374	114	48	.....
13.....		246	66	.....	28.....	393	114	48	.....
14.....		246	61	.....	29.....	412	107	48	.....
15.....		225	61	.....	30.....	431	101	48	.....
					31.....		95	48	.....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of American River near Nile, Wash., for the period June 23 to Sept. 5, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
June 26-30.....	431	355	393	3,900	B.
July.....	462	95	236	14,500	B.
August.....	95	48	65	4,010	B.
September 1-5.....	48	48	48	476	B.
The period.....				22,900	

NORTH FORK OF TIETON RIVER BELOW CLEAR CREEK, NEAR NACHES, WASH.

LOCATION.—In sec. 12, T. 13 N., R. 12 E. Willamette meridian (unsurveyed), below Clear Creek dam of the United States Reclamation Service, a quarter of a mile below Clear Creek, a quarter of a mile above Cold Creek and 7 miles above South Fork; about 30 miles southwest of Naches, in Yakima County.

DRAINAGE AREA.—61 square miles.

RECORDS AVAILABLE.—May 5 to September 30, 1914.

GAGE.—Vertical staff on left bank, 1,000 feet below Clear Creek dam of the United States Reclamation Service, read to hundredths four times daily by O. B. Vaughn. Prior to May 21 gage height was at same site but at datum 0.68 higher than present datum; all gage heights reduced to present datum.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Bed of stream at gage is of solid rock. Control, about 100 feet below gage, is formed by rock ledge and should be permanent. Channel curves sharply to right a short distance below gage. Both banks are high but right bank will overflow at gage height of about 10 feet. A log jam about 200 feet below gage may cause slight backwater effect at extreme high stages. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 3.70 feet at 7.30 p. m. June 1, and 7 a. m. June 2 (discharge, 780 second-feet); minimum stage recorded, 0.62 foot at 2 p. m. and 7 p. m. September 13 (discharge, 106 second-feet).

WINTER FLOW.—Observations discontinued during winter months.

DIVERSIONS.—None.

REGULATION.—United States Reclamation Service dam across stream just below Clear Creek impounds 2,000 acre-feet of water which is used for equalizing diurnal fluctuation during the irrigation season. When completed the dam will impound 8,000 acre-feet of water.

ACCURACY.—Gage-height record reliable; rating well defined throughout; results apparently excellent.

COOPERATION.—Gage-height record, measurements, and computed discharge furnished by United States Reclamation Service.

Discharge measurements of North Fork of Tieton River below Clear Creek, near Naches, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
May 21	Paul Taylor.....	2.92	592	June 17	Ray and Moxley.....	3.21	654
29	R. Ray.....	1.98	328	July 3	R. Ray.....	2.59	462
June 1	do.....	3.14	615	21	do.....	1.42	219
2	do.....	3.45	709	22	do.....	1.42	226
9	do.....	1.64	271	Aug. 26	do.....	0.90	145
16	F. E. Moxley.....	2.87	538	Sept. 30	Tuttle and Taylor.....	0.85	135
16	do.....	2.93	544				

Daily discharge, in second-feet, of North Fork of Tieton River below Clear Creek, near Naches, Wash., from May 5 to Sept. 30, 1914.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1.....		690	422	245	178	16.....	632	604	310	218	141
2.....		750	485	254	178	17.....	563	604	300	186	210
3.....		660	446	254	186	18.....	550	576	320	186	236
4.....		472	410	254	142	19.....	524	485	341	202	210
5.....	374	386	352	245	170	20.....	524	422	310	178	178
6.....	374	330	320	245	178	21.....	576	341	210	210	156
7.....	363	290	330	227	163	22.....	563	300	218	210	145
8.....	363	272	341	254	123	23.....	576	272	245	186	152
9.....	352	254	341	227	121	24.....	590	374	236	186	163
10.....	374	254	310	227	139	25.....	537	363	227	194	202
11.....	398	263	330	245	138	26.....	446	310	218	202	245
12.....	459	290	330	254	116	27.....	410	310	236	218	186
13.....	537	352	374	245	108	28.....	352	330	218	202	156
14.....	646	434	310	254	178	29.....	330	374	227	210	142
15.....	720	524	341	263	142	30.....	363	410	245	186	145
						31.....	472		254	178	

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of North Fork of Tieton River below Clear Creek, near Naches, Wash., for the period May 5 to Sept. 30, 1914.

[Drainage area, 60 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accu- racy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
May 5-31.....	720	330	480	7.87	7.90	25,700	A.
June.....	750	254	410	6.72	7.50	24,400	A.
July.....	485	210	308	5.05	5.82	19,000	A.
August.....	263	178	221	3.62	4.17	13,600	A.
September.....	245	108	164	2.69	3.00	9,780	A.
The period.....						92,500	

TIETON RIVER AT McALLISTER MEADOWS, NEAR NACHES, WASH.

LOCATION.—About 800 feet above the McAllister Meadows dam site, one-half mile above Wildcat Creek, $1\frac{1}{2}$ miles below the junction of the forks of the river, $7\frac{1}{2}$ miles above the headworks of Tieton canal, and 23 miles southwest of Naches.

DRAINAGE AREA.—187 square miles.

RECORDS AVAILABLE.—August 28 to November 24, 1908; March 21, 1909, to September 30, 1914; fragmentary.

GAGE.—Vertical staff on left bank.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet below gage, or by wading near gage.

CHANNEL AND CONTROL.—Gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year 3.42 feet at 7 a. m.

June 18 (discharge, 1,270 second-feet); minimum stage recorded, 1.50 feet at 5.30 p. m. September 13 (discharge, 192 second-feet).

1908-1912 and June 17 to September 30, 1914: Maximum stage recorded, 6.2 feet at 3.30 p. m. November 23, 1909 (discharge, 4,200 second-feet); minimum stage recorded, 1.20 feet January 12, 1910 (discharge, 127 second-feet).¹

WINTER FLOW.—Not affected by ice.

ACCURACY.—Results fair.

COOPERATION.—Records furnished by the United States Reclamation Service since April 1, 1912.

Discharge measurements of Tieton River at McAllister Meadows, near Naches, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
June 17	F. E. Moxley.....	3.34	1,180
Aug. 27	Calland and Moxley.....	1.82	300
Sept. 30	Taylor and Tuttle.....	1.68	239

Daily discharge, in second-feet, of Tieton River at McAllister Meadows, near Naches, Wash., for the period June 17 to Sept. 25, 1914.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1.....		880	420	246	16.....		590	338	229
2.....		915	395	246	17.....	1,210	560	275	286
3.....		880	410	246	18.....	1,170	560	282	356
4.....		845	410	246	19.....	1,060	590	286	334
5.....		650	370	224	20.....	950	590	286	286
6.....		650	390	235	21.....	810	445	286	259
7.....		650	380	240	22.....	680	420	289	243
8.....		680	390	215	23.....	620	450	278	240
9.....		680	351	208	24.....	740	450	265	246
10.....		620	325	202	25.....	810	440	265	259
11.....		620	342	235	26.....	680	410	268	255
12.....		650	351	202	27.....	710	415	272	251
13.....		710	351	197	28.....	680	405	278	247
14.....		620	351	208	29.....	740	400	272	243
15.....		620	360	259	30.....	810	410	275	240
					31.....		435	259	.....

NOTE.—Discharge determined from a well-defined rating curve.

¹ Revised from original data.

Monthly discharge of Tieton River at McAllister Meadows, near Naches, Wash., for the period June 17 to Sept. 30, 1914.

[Drainage area, 187 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
June 17-30.....	1,210	620	834	4.46	2.32	23,100	A.
July.....	915	400	588	3.15	3.63	36,200	B.
August.....	420	259	325	1.74	2.01	20,000	B.
September.....	356	197	246	1.32	1.47	14,600	B.
The period.....	.....	.....	.....	.....	.....	93,900	

TIETON RIVER AT HEADWORKS OF TIETON CANAL, NEAR NACHES, WASH.

LOCATION.—In sec. 30, T. 14, N., R. 15 E. (unsurveyed), one-fourth mile below intake of Tieton canal, 16 miles southwest of Naches, and 15 miles above mouth of river.

DRAINAGE AREA.—240 square miles.

RECORDS AVAILABLE.—April 17 to September 17, 1906, fragmentary gage heights; July 5, 1907, to September 30, 1914. From October 27, 1907, to April 8, 1909, a gage was read at Weisberger's power plant 2 miles below intake; records obtained at the two sites are comparable.

GAGE.—Friez water-stage recorder on right bank installed July 18, 1911, at same datum as vertical staff gage and automatic gage previously used.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet below gage; bed of stream rough and conditions not first-class; low-water measurements made by wading.

CHANNEL AND CONTROL.—Gravel and small stones; shifts slightly at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.23 feet at 1 a. m.

January 6 (discharge, 1,950 second-feet); minimum stage, 1.42 feet at 6 p. m.

September 6 (discharge, 24 second-feet).

1907-1914: Maximum stage recorded, 6.90 feet November 23, 1909 (discharge, 4,970 second-feet); minimum stage recorded, 1.42 feet at 6 p. m. September 6, 1914 (discharge, 24 second-feet).

WINTER FLOW.—Anchor ice on riffle control frequently causes backwater at gage; winter discharge estimated by comparison of records of other stations on river.

DIVERSIONS.—Tieton canal has diverted water past gage since 1910.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Tieton River at headworks of Tieton canal, near Naches, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 7	Reed and Moxley.....	2.61	195	June 16	F. E. Moxley.....	4.35	1,090
8	.....do.....	2.81	243	July 3	Moxley and Bloomsburg.	3.55	575
Nov. 18	F. E. Moxley.....	2.92	302	Aug. 19	Calland and Moxley....	1.80	48.4
Dec. 1	Parker and Taylor.....	2.88	279	22	.....do.....	2.23	101
10	Moxley and Patterson..	2.73	212	24	R. S. Calland.....	1.58	29.8
May 16	F. E. Moxley.....	4.72	1,440	28	.....do.....	1.98	55.9
19	Paul Taylor.....	4.36	1,150				

Daily discharge, in second-feet, of Tieton River at headworks of Tieton canal, near Naches, Wash., during the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	124	284	248	185	268	380	360	630	1,170	600	176	51
2.....	144	266	266	200	268	380	425	930	1,520	630	162	50
3.....	129	232	248	185	235	360	425	1,170	1,520	630	162	47
4.....	117	232	232	215	268	360	575	1,010	1,090	660	162	55
5.....	121	215	248	1,430	250	340	690	850	850	450	142	94
6.....	129	248	248	1,700	235	360	720	815	720	450	162	44
7.....	154	232	248	1,610	268	380	780	815	660	450	122	46
8.....	157	232	232	1,170	235	425	850	780	575	475	110	25
9.....	171	248	232	850	235	475	850	750	525	475	112	25
10.....	171	266	232	720	235	450	930	780	475	425	77	25
11.....	344	248	232	630	235	450	1,010	850	500	400	92	34
12.....	434	232	232	550	235	450	1,010	930	550	425	108	25
13.....	458	215	232	500	220	500	1,090	1,090	660	475	106	25
14.....	388	200	232	475	220	600	1,170	1,340	750	400	108	44
15.....	344	200	215	450	220	660	1,430	1,520	930	425	142	154
16.....	311	200	215	425	220	720	1,340	1,520	1,090	380	106	117
17.....	284	248	215	400	220	780	1,170	1,250	1,170	303	48	142
18.....	266	266	215	380	220	815	1,090	1,170	1,090	285	51	268
19.....	284	248	200	340	220	815	1,250	1,170	850	320	56	268
20.....	284	215	200	340	220	815	1,340	1,090	750	340	64	235
21.....	304	215	171	340	235	780	1,170	1,170	575	190	60	205
22.....	304	200	185	360	235	750	1,010	1,170	475	148	66	205
23.....	284	185	200	340	220	720	930	1,170	400	176	53	205
24.....	304	248	200	320	235	690	815	1,250	500	176	47	220
25.....	304	232	185	320	235	630	750	1,170	575	176	51	235
26.....	284	215	185	303	235	600	720	930	450	137	53	320
27.....	304	232	185	303	285	550	660	850	450	142	62	285
28.....	266	232	185	285	303	475	575	720	450	142	68	235
29.....	248	215	185	285	.....	450	525	660	475	129	79	205
30.....	231	252	185	285	.....	425	525	690	550	156	74	190
31.....	231	.....	185	285	.....	450	.....	850	.....	176	57	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Jan. 4; and Jan. 5 to Sept. 30.

Combined monthly discharge of Tieton River and canal at headworks of Tieton canal, near Naches, Wash., for year ending Sept. 30, 1914.

[Drainage area, 240 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Natural flow (second-feet).		Run-off (depth in inches on drainage area).	Accuracy of observed discharge.
	Maxi-mum.	Mini-mum.	Mean.	Observed.	Diverted in Tieton Canal.	Natural flow.	Mean.	Per square mile.		
October.....	458	117	254	15,600	1,360	17,000	276	1.15	1.33	A.
November.....	284	185	231	13,800	969	14,800	249	1.04	1.16	A.
December.....	266	171	215	13,200	.....	13,200	215	.896	1.03	B.
January.....	1,700	185	522	32,100	.....	32,100	522	2.18	2.51	A.
February.....	303	220	240	13,360	.....	13,360	240	1.00	1.04	A.
March.....	815	340	550	33,800	.....	33,800	550	2.29	2.64	A.
April.....	1,430	360	873	51,900	2,780	54,700	919	3.83	4.27	A.
May.....	1,520	630	1,000	61,700	12,600	74,300	1,210	5.04	5.81	A..
June.....	1,520	400	745	44,300	11,100	55,400	931	3.88	4.33	A.
July.....	660	129	347	21,300	16,500	37,800	615	2.56	2.95	A.
August.....	176	47	95	5,830	15,600	21,400	348	1.45	1.67	A.
September....	320	25	136	8,100	9,080	17,200	289	1.20	1.34	A.
The year.	1,700	25	435	315,000	70,000	385,000	532	2.22	30.08	

TIETON CANAL NEAR NACHES, WASH.

LOCATION.—In sec. 30 T. 14 N., R. 15 E., unsurveyed about 500 feet below intake of canal and about 16 miles southwest of Naches.

RECORDS AVAILABLE.—1910 to 1914.

GAGE.—Combined float and vertical staff in stilling box.

DISCHARGE MEASUREMENTS.—Made from a gaging bridge 30 feet below the gage or by wading.

CHANNEL AND CONTROL.—Earth section above the concrete-lined section; practically permanent except when affected by growth of moss.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and also for irrigation seasons 1910–1914, 4.46 feet June 30 and July 1 (discharge, 275 second-feet); no water in canal October 11 to November 21, December 1 to April 17, and September 5.

ACCURACY.—Results good except when discharge relation is affected by growth of moss.

COOPERATION.—Records furnished by United States Reclamation Service.

Discharge measurements of Tieton canal near Naches, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Apr. 22	A. Philpott.....	1.22	40.0	June 26	A. Philpott.....	4.17	247
May 13	.....do.....	3.69	219	27	.....do.....	4.35	265
May 16	F. E. Moxley.....	3.65	218	July 3	.....do.....	4.38	272
June 16	.....do.....	2.60	128	3	Moxley and Bloomes-		
18	.....do.....	3.26	181		burg.....	4.36	268
22	A. Philpott.....	3.96	236	Aug. 19	A. Philpott.....	4.39	260
					Moxley and Calland...	4.20	253

Daily discharge, in second-feet, of Tieton canal near Naches, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	85	.....	.....	200	182	275	258	235
2.....	85	.....	.....	200	182	270	258	235
3.....	85	.....	.....	200	151	270	263	235
4.....	85	.....	.....	200	151	270	263	222
5.....	64	.....	.....	200	151	270	263	0
6.....	64	.....	.....	204	151	270	263	215
7.....	54	.....	.....	204	136	270	263	215
8.....	54	.....	.....	204	136	270	263	215
9.....	54	.....	.....	211	136	270	263	212
10.....	54	.....	.....	213	136	270	263	200
11.....	.....	.....	.....	213	136	270	262	222
12.....	.....	.....	.....	213	136	270	260	209
13.....	.....	.....	.....	213	136	270	260	196
14.....	.....	.....	.....	213	136	270	260	179
15.....	.....	.....	.....	213	136	270	260	163
16.....	.....	.....	.....	213	136	270	255	153
17.....	.....	.....	.....	213	163	270	255	146
18.....	.....	.....	30	213	182	270	255	136
19.....	.....	.....	30	213	209	270	255	132
20.....	.....	.....	30	213	218	270	252	110
21.....	.....	.....	30	218	227	270	250	110
22.....	.....	45	46	218	235	270	250	93
23.....	.....	45	83	218	244	270	247	93
24.....	.....	45	122	218	250	270	246	93
25.....	.....	59	146	200	250	270	242	93
26.....	.....	59	157	200	250	270	242	93
27.....	.....	59	171	191	250	270	242	93
28.....	.....	59	171	182	266	263	242	93
29.....	.....	59	187	182	270	258	242	93
30.....	.....	59	200	182	275	258	242	93
31.....	.....	.....	.....	182	.....	258	238	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Tieton canal near Naches, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October 1-10.....	85	54	68.4	1,360	B.
November 22-30.....	59	45	54.3	969	B.
April 18-30.....	200	30	108	2,780	A.
May.....	218	182	205	12,600	A.
June.....	275	136	187	11,100	A.
July.....	275	258	269	16,500	A.
August.....	263	238	254	15,600	A.
September.....	235	0	153	9,080	A.

NORTH FORK OF AHTANUM CREEK NEAR TAMPICO, WASH.

LOCATION.—In sec. 2, T. 12 N., R. 15 E., at George Prior's ranch, about 100 feet below Nasty Creek, and about $3\frac{1}{2}$ miles northwest of Tampico.

DRAINAGE AREA.—69 square miles.

RECORDS AVAILABLE.—August 26, 1907, to August 25, 1914.

GAGE.—Vertical staff on left bank. A Stevens water stage recorder was installed April 2, 1913, but gage readings have been reduced to equivalent of those for the staff gage.

DISCHARGE MEASUREMENTS.—Made from a cable 500 feet below the gage or by wading.

CHANNEL AND CONTROL.—Gravel and bowlders; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage during year, 3.08 feet at 3 a. m. April 14 (discharge, 340 second-feet); minimum stage recorded, 1.32 feet at 3 p. m. December 25 (discharge, 11.8 second-feet).

1907-1911 and 1913-1914: Maximum stage recorded, 3.3 feet March 2, 1910 (discharge, 684 second-feet); minimum stage recorded, 1.32 feet at 3 p. m. December 25, 1914 (discharge, 11.8 second-feet).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Above all diversions.

ACCURACY.—Results good after installation of water-stage recorder; previous records not entirely satisfactory.

Discharge measurements of North Fork of Ahtanum Creek near Tampico, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.	Date.	Made by—	Gage height.	Dis- charge.
Nov. 10	F. B. Storey.....	<i>Feet.</i> 1.52	<i>Sec.-ft.</i> 26.1	Aug. 4	I. L. Collier.....	<i>Feet.</i> 1.60	<i>Sec.-ft.</i> 28.9
Mar. 17	.....do.....	2.41	164	Aug. 5	.....do.....	1.58	25.8
Mar. 17	I. L. Collier.....	2.41	168	Aug. 14	.....do.....	1.55	24.4
May 23	.....do.....	2.96	308				

Daily discharge, in second-feet, of North Fork of Ahtanum Creek near Tampico, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	24	26	20	.....	.....	.....	82	212	259	92	32	21
2.....	24	26	19	.....	.....	.....	98	259	275	92	31	20
3.....	24	26	19	.....	.....	.....	127	299	259	87	32	20
4.....	22	26	19	.....	.....	.....	162	269	233	82	32	20
5.....	23	26	19	.....	.....	.....	182	248	215	78	29	20
6.....	24	27	19	.....	.....	.....	202	246	202	78	27	20
7.....	24	26	19	.....	.....	.....	220	254	187	76	27	20
8.....	27	27	20	.....	.....	.....	233	238	170	73	27	22
9.....	25	28	20	.....	.....	.....	235	233	157	68	27	23
10.....	27	26	20	.....	.....	.....	248	233	152	67	27	22
11.....	28	26	20	.....	.....	.....	251	238	150	64	26	20
12.....	28	26	20	.....	.....	.....	248	259	152	65	26	20
13.....	30	20	20	.....	.....	.....	264	269	155	62	24	21
14.....	28	20	22	.....	22	138	321	238	157	58	24	21
15.....	26	20	22	.....	.....	146	294	238	172	52	22	26
16.....	25	21	20	.....	.....	155	264	238	172	48	21	30
17.....	25	22	20	35	.....	164	259	238	170	45	25	30
18.....	25	21	28	.....	.....	165	299	238	157	45	24	29
19.....	29	20	92	.....	.....	166	304	238	143	41	23	28
20.....	29	20	140	.....	.....	168	280	256	131	39	22	26
21.....	29	20	118	.....	27	170	259	273	118	37	23	24
22.....	29	20	89	.....	.....	164	248	290	112	33	23	22
23.....	28	20	46	.....	.....	160	230	307	104	34	24	39
24.....	27	22	20	.....	.....	145	220	286	116	35	24	24
25.....	26	21	14	.....	.....	125	215	265	110	34	23	22
26.....	26	20	19	.....	.....	110	207	243	100	34	22	21
27.....	26	22	19	.....	.....	96	192	238	98	35	22	21
28.....	26	20	19	.....	30	92	177	217	92	37	22	20
29.....	25	20	19	.....	.....	83	180	215	92	33	22	22
30.....	26	20	19	29	.....	82	212	215	92	33	22	22
31.....	26	.....	19	.....	.....	80	.....	233	.....	33	21	.....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 12 from a rating curve fairly well defined between 20 and 250 second-feet; Nov. 13 to Sept. 30 from a rating curve well defined between 20 and 350 second-feet. Discharge interpolated, owing to lack of gage readings: Mar. 15, 16, and 18–20; May 15–18, 20–22, 24, and 25; Aug. 22–23, 25, 27, and 29–31; Sept. 2, 4, 6, 8, 10, 12, 13, 15, 17, 19, and 20.

Monthly discharge of North Fork of Ahtanum Creek near Tampico, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	30	22	26.2	1,610	B.
November.....	28	20	22.8	1,360	B.
December.....	140	14	32.2	1,980	B.
March 14–31.....	170	80	134	4,780	B.
April.....	321	82	224	13,300	A.
May.....	307	212	249	15,300	A.
June.....	275	92	157	9,340	A.
July.....	92	33	54.5	3,350	A.
August.....	32	21	25.0	1,540	A.
September.....	39	20	23.2	1,380	B.

SOUTH FORK OF AHTANUM CREEK NEAR TAMPICO, WASH.

LOCATION.—In sec. 24, T. 12 N., R. 15 E., at Shannafelt's ranch, 2 miles south-west of Tampico and 1 mile above the junction with the North Fork of Ahtanum Creek.

DRAINAGE AREA.—26 square miles (revised measurement).

RECORDS AVAILABLE.—August 27, 1907, to October 31, 1914, when station was discontinued.

GAGE.—October 1 to March 15, 1914, vertical staff on right bank at a footing about 500 feet below the ranch-house; March 16 to October 31 vertical staff on right bank, 100 feet above previous gage, at different datum and above a different control.

DISCHARGE MEASUREMENTS.—Made from a private bridge one-fourth mile below gage, or by wading.

CHANNEL AND CONTROL.—Gravel and sand; somewhat shifting; banks overgrown with brush; two channels at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.05 feet at 9.10 a. m. May 16 (discharge, 158 second-feet); minimum stage recorded, 1.93 feet October 29 and 30, 1914 (discharge, 3.1 second-feet).

1908-1914: Maximum stage recorded, 5.50 feet March 2, 1910 (discharge, 362 second-feet); minimum stage recorded, 2.52 feet September 3, 1911 (discharge, 0.3 second-foot).

WINTER FLOW.—Discharge relation not seriously affected by ice.

DIVERSIONS.—Above all important diversions.

ACCURACY.—Results fair.

Discharge measurements of South Fork of Ahtanum Creek near Tampico, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Nov. 11	F. B. Storey.....	2.72	7.75	Aug. 4	I. L. Collier.....	2.10	7.29
Mar. 16	Storey and Collier.....	a 2.90	78.1	6	.....do.....	2.08	6.48
May 22	I. L. Collier.....	3.58	73.8	14	.....do.....	2.05	5.82
23	.....do.....	3.66	87.0	21	Parker and Hoyt.....	2.04	5.41

a New gage installed. Old gage read 3.85 feet before removal.

Daily discharge, in second-feet, of South Fork of Ahtanum Creek near Tampico, Wash., from Oct. 1, 1913, to Oct. 31, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....	7.2	8.2	6.8	6.0	9.3	25	52	125	70	20	6.1	5.5	5.8
2.....	7.2	8.2	7.2	6.2	6.2	29	64	122	67	19	6.4	5.5	5.8
3.....	7.2	8.2	6.8	6.2	10.5	30	58	122	70	16	6.7	5.5	6.8
4.....	7.2	8.2	5.8	6.0	10.5	31	58	125	67	15	7.0	5.8	6.5
5.....	7.2	8.2	6.1	19.2	7.2	41	70	125	67	15	7.0	5.8	6.5
6.....	7.2	9.3	5.8	31	8.0	45	73	111	64	11.8	5.8	5.8	6.2
7.....	7.2	8.6	10.8	45	7.0	70	76	114	58	10.0	5.8	5.8	6.2
8.....	8.0	8.6	5.1	34	9.0	74	82	111	55	10.0	5.8	5.8	6.2
9.....	8.0	8.2	8.2	19.2	9.0	78	79	114	49	10.0	5.8	4.5	6.5
10.....	8.0	7.8	7.0	14.2	9.6	65	76	114	49	9.4	4.5	4.5	7.6
11.....	7.8	7.6	8.8	14.2	8.6	41	70	119	36	10.0	4.5	4.5	7.0
12.....	7.8	7.2	9.3	14.2	8.6	45	82	119	32	10.0	4.5	4.8	8.5
13.....	7.8	7.2	7.0	14.2	9.0	74	85	122	29	13.5	4.5	4.8	7.6
14.....	7.8	7.2	5.8	10.5	6.7	88	91	125	21	12.8	6.0	4.5	7.0
15.....	7.8	7.2	7.0	10.5	7.2	74	100	154	27	10.0	5.8	4.5	6.5
16.....	7.8	7.2	7.0	12.0	8.0	78	114	154	29	10.4	6.0	5.2	5.8
17.....	7.4	7.2	7.2	12.0	8.0	76	125	142	29	10.4	5.8	5.5	6.0
18.....	7.4	7.2	4.1	10.5	8.0	64	125	131	39	10.0	5.8	6.0	6.2
19.....	7.4	7.6	5.6	9.0	8.6	85	125	120	39	10.0	5.8	6.0	7.0
20.....	7.4	7.4	5.5	9.0	10.2	76	125	109	39	10.0	5.8	5.8	6.5
21.....	7.4	7.4	6.7	8.0	16.5	70	122	98	36	10.0	5.5	5.5	6.5
22.....	7.4	7.2	7.2	13.4	16.5	58	122	87	36	9.7	5.8	5.5	5.8
23.....	7.4	7.2	5.6	12.0	14.2	100	118	76	36	8.5	5.8	5.5	5.8
24.....	7.4	7.2	6.7	11.1	12.0	100	114	79	34	8.5	5.8	5.5	5.8
25.....	7.4	7.2	6.7	10.5	12.0	76	114	76	36	8.5	5.5	5.2	5.5
26.....	7.4	7.0	6.1	12.0	16.5	70	91	73	36	7.6	5.8	5.2	4.5
27.....	7.4	7.0	6.1	10.5	22.0	73	97	70	34	7.0	5.5	5.0	3.3
28.....	7.4	7.4	5.1	6.0	25	70	104	70	27	6.5	5.5	4.8	3.5
29.....	7.4	7.0	5.1	9.0	.....	46	118	70	25	6.5	5.5	5.0	3.1
30.....	7.4	7.0	6.4	9.0	.....	54	125	67	27	5.8	5.5	6.5	3.1
31.....	7.4	.....	6.4	9.0	.....	52	.....	67	.....	5.8	5.5	.....	3.5

NOTE.—Discharge determined as follows: Sept. 30 to Mar. 16, from a rating curve fairly well defined between 5 and 100 second-feet; Mar. 17 to May 16, from a poorly defined rating curve; May 17-22, by indirect method for shifting channels; May 23 to Oct. 31, from a rating curve fairly well defined between 5 and 90 second-feet. Discharge interpolated, owing to lack of gage readings, Aug. 1-3.

Monthly discharge of South Fork of Ahtanum Creek near Tampico, Wash., from October, 1913, to October, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
1914.					
October.....	8.0	7.2	7.49	461	B.
November.....	9.3	7.0	7.60	452	B.
December.....	10.8	4.1	6.61	406	B.
January.....	45	6.0	13.3	818	C.
February.....	25	6.2	10.9	605	C.
March.....	100	25	63.2	3,890	C.
April.....	125	52	95.2	5,660	D.
May.....	154	67	107	6,580	D.
June.....	70	21	42.1	2,510	C.
July.....	20	5.8	10.6	652	C.
August.....	7.0	4.5	5.71	351	C.
September.....	6.0	4.5	5.33	317	C.
The year.....	154	4.1	31.3	22,700	
1915.					
October.....	8.5	3.1	5.89	362	C.

NEW RESERVATION CANAL NEAR PARKER,¹ WASH.

LOCATION.—In sec. 20, T. 12 N., R. 19 E., 400 feet below intake of canal, just south of Union Gap, 1 mile north of Parker, 2 miles south of Yakima, and 5½ miles north-west of Wapato.

RECORDS AVAILABLE.—1904 to September 30, 1914.

GAGE.—Vertical staff on right bank at gaging bridge. Prior to March, 1911, gage was one-fourth mile below present site.

DISCHARGE MEASUREMENTS.—Made from wooden gaging bridge.

CHANNEL AND CONTROL.—Gravel and small stones; practically permanent except for growth of aquatic plants.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.41 feet May 14-19 (discharge, 662 second-feet); minimum stage recorded, 0.60 foot April 1 (discharge, 62.3 second-feet). No water in canal October 31 to March 31.

1904-1914: Maximum stage recorded, 4.41 feet May 14-19, 1914 (discharge, 6.62 second-feet). No water in canal during nonirrigating season.

ACCURACY.—Results fair. The discharge relation is affected by growth of weeds and operation of canal.

COOPERATION.—Records furnished by United States Reclamation Service and Indian Service.

¹ Formerly called "near Yakima, Wash."

Discharge measurements of New Reservation canal near Parker, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 11	Winston and Skillin	2.40	156	July 7	Bloomsburg and Moxley	5.05	564
22	do	2.20	147	8	E. F. Skillin	4.98	549
26	Reed and Moxley	1.88	113	9	do	4.92	520
Nov. 30	Winston and Skillin	1.50	79.3	13	W. A. Bloomsburg	5.06	520
Apr. 3	Reed and Moxley	.20	6.12	20	E. F. Skillin	4.71	483
2	F. E. Moxley	.81	81	20	E. F. Moxley	4.76	456
13	W. E. Winston	3.80	532	27	E. F. Skillin	4.15	388
20	do	3.07	403	Aug. 5	do	3.14	223
21	F. E. Moxley	3.36	434	4	W. A. Bloomsburg	3.03	208
May 28	W. E. Winston	3.92	507	13	do	3.03	190
4	do	1.34	210	19	E. F. Skillin	4.67	440
12	F. E. Moxley	4.31	617	23	do	4.57	544
13	W. E. Winston	4.41	661	25	do	4.20	481
16	do	3.90	558	26	do	4.08	474
19	E. F. Skillin	4.41	653	27	do	4.02	464
21	do	4.21	599	31	do	3.86	450
June 29	do	3.59	454	Sept. 3	Moxley and Calland	3.61	408
4	do	3.58	425	3	E. F. Skillin	3.51	409
6	F. E. Moxley	3.83	473	4	do	2.03	189
10	E. F. Skillin	4.12	498	8	do	1.79	158
16	do	4.51	562	10	do	1.80	150
18	do	4.71	606	14	P. E. Moxley	1.80	125
19	Taylor and Moxley	4.88	632	15	E. F. Skillin	1.61	127
22	E. F. Skillin	4.56	544	30	do	1.95	180
26	do	5.11	638				
30	do	5.10	630				
July 2	do	5.19	624				

Daily discharge, in second-feet, of New Reservation canal near Parker, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Apr.	May.	June.	July.	Aug.	Sept.
1.	252	62.3	584	358	608	340	406
2.	270	77.5	588	370	610	340	390
3.	266	133	590	370	610	277	412
4.	268	172	594	426	610	219	187
5.	268	249	658	454	614	219	181
6.	268	312	590	472	578	226	189
7.	268	312	596	488	568	286	189
8.	227	336	606	494	552	444	147
9.	198	410	606	522	532	450	147
10.	184	440	606	474	520	452	157
11.	169	500	606	478	502	442	156
12.	154	500	614	494	498	448	154
13.	144	522	660	518	490	446	147
14.	142	524	662	534	506	558	132
15.	140	524	662	554	516	546	129
16.	125	540	662	564	488	546	136
17.	118	548	662	586	472	546	142
18.	118	544	662	600	488	554	152
19.	118	275	662	618	480	546	152
20.	117	386	642	618	476	532	156
21.	129	293	602	592	460	520	157
22.	132	480	556	540	444	500	156
23.	125	546	532	540	468	480	157
24.	112	552	520	578	460	500	157
25.	112	558	496	614	400	474	152
26.	111	558	484	628	340	454	163
27.	108	566	408	622	370	460	164
28.	106	564	384	626	412	410	169
29.	100	564	452	626	408	410	169
30.	94.3	572	420	626	394	410	177
31.			374		360	410	

NOTE.—Discharge determined by indirect method of shifting channels.

Monthly discharge of New Reservation canal near Parker, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	270	94.3	159	9,780	B.
April.....	572	62.3	421	25,000	B.
May.....	662	374	572	35,200	B.
June.....	628	358	533	31,700	B.
July.....	614	340	491	30,200	B.
August.....	558	219	434	26,700	B.
September.....	406	129	183	10,900	B.

OLD RESERVATION CANAL NEAR PARKER,¹ WASH.

LOCATION.—In sec. 28, T. 12 N., R. 19 E., 300 feet below the intake and 500 feet above the controlling waste and first lateral, about 1½ miles southeast of Parker Siding and 2 miles northeast of Wapato.

RECORDS AVAILABLE.—1904 to September 30, 1914.

GAGE.—Vertical staff attached to gaging bridge.

DISCHARGE MEASUREMENTS.—Made from a wooden gaging bridge.

CHANNEL AND CONTROL.—Old slough channel; mud bed; shifts at full head of water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.20 feet June 17 (discharge, 332 second-feet); minimum stage recorded, zero April 1-3 (discharge, 13 second-feet). No water diverted November 1 to March 31.

1904-1914: Maximum stage recorded, 4.20 feet June 17, 1914 (discharge, 332 second-feet). No water diverted during nonirrigating season.

ACCURACY.—Results fair.

COOPERATION.—Records furnished by United States Reclamation Service and United States Indian Service.

Discharge measurements of Old Reservation canal near Parker, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 22	Winston and Skillin.....	1.24	75.0	June 29	E. F. Skillin.....	3.32	244
26	Reed and Moxley.....	1.21	73.8	July 5	do.....	3.22	235
30	Winston and Skillin.....	1.15	69.3	7	Moxley and Bloomsburg.....	3.10	218
Nov. 3	Moxley and Reed.....	.22	22.8	13	F. E. Moxley.....	2.73	204
Apr. 2	F. E. Moxley.....	.42	30	13	E. F. Skillin.....	2.82	205
13	E. F. Winston.....	3.52	261	23	do.....	2.10	139
20	do.....	3.51	292	26	do.....	2.02	136
21	F. E. Moxley.....	3.80	278	Aug. 4	W. A. Bloomsburg.....	1.61	99
28	E. F. Winston.....	3.72	282	6	E. F. Skillin.....	1.60	104
May 13	do.....	4.00	309	8	do.....	1.42	99
19	E. F. Skillin.....	3.80	290	20	do.....	2.10	142
21	do.....	3.66	272	25	do.....	2.00	138
28	do.....	2.53	174	27	do.....	2.12	145
June 3	do.....	2.81	195	31	do.....	1.59	99
6	F. E. Moxley.....	3.03	215	31	Moxley and Calland.....	1.60	99
12	E. F. Skillin.....	3.56	270	Sept. 4	E. F. Skillin.....	2.21	152
18	do.....	4.10	319	14	do.....	1.34	85
20	F. E. Moxley.....	4.01	315	14	F. E. Moxley.....	1.32	81
24	E. F. Skillin.....	3.45	261	28	E. F. Skillin.....	1.42	84

¹ Formerly called "near Wapato," Wash.

Daily discharge, in second-feet, of Old Reservation canal near Parker, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	128	13	277	180	248	130	88
2.....	140	13	297	197	260	131	120
3.....	153	13	297	197	267	116	132
4.....	153	17	300	195	257	101	130
5.....	163	73	302	197	262	101	116
6.....	153	93	297	210	240	101	108
7.....	144	116	294	220	224	126	94
8.....	130	132	290	220	215	146	87
9.....	108	197	290	242	206	140	88
10.....	108	260	290	247	195	151	87
11.....	112	272	294	247	188	144	86
12.....	112	272	302	267	180	144	83
13.....	112	264	302	277	197	147	80
14.....	112	262	314	290	197	149	81
15.....	112	262	312	294	186	142	81
16.....	113	272	312	317	178	140	86
17.....	113	274	310	332	168	143	88
18.....	113	277	307	322	170	147	93
19.....	100	290	292	317	166	145	94
20.....	86	292	287	313	164	142	76
21.....	79	292	282	297	156	135	74
22.....	72	290	272	287	147	130	73
23.....	72	287	242	272	142	130	73
24.....	72	287	206	260	134	132	79
25.....	72	292	188	267	135	132	80
26.....	72	284	180	267	136	134	80
27.....	72	284	172	252	132	138	81
28.....	72	282	172	242	142	140	81
29.....	70	272	172	243	132	139	81
30.....	69	272	174	247	134	136	81
31.....	69	.....	180	.....	132	108	.....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Old Reservation canal near Parker, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	153	69	105	6,460	B.
April.....	292	13	217	12,000	B.
May.....	314	172	265	16,300	B.
June.....	332	180	257	15,300	B.
July.....	257	132	183	11,200	B.
August.....	151	101	124	8,210	B.
September.....	132	73	89.4	5,320	B.

SUNNYSIDE CANAL NEAR WAPATO, WASH.

LOCATION.—In sec. 28, T. 12 N., R. 19 E., 400 feet below the intake, 1 mile east of Parker, and $3\frac{1}{4}$ miles northwest of Wapato.

RECORDS AVAILABLE.—1904 to September 30, 1914.

GAGE.—Lietz water-stage recorder since 1909. Prior to 1909 several inclined gages set at arbitrary datum.

DISCHARGE MEASUREMENTS.—Made from footbridge 200 feet below gage.

CHANNEL AND CONTROL.—Gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.96 feet August 7 (discharge, 988 second-feet); no water in canal November 29 to March 15.

1904-1914: Maximum stage recorded, 4.96 feet August 7, 1914 (discharge, 988 second-feet); no water during non-irrigating seasons.

COOPERATION.—Records furnished by the United States Reclamation Service.

Indirect methods used to obtain discharge, as operation of canal causes changes in discharge relation.

Discharge measurements of Sunnyside canal near Wapato, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Fect.</i>	<i>Sec.-ft.</i>			<i>Fect.</i>	<i>Sec.-ft.</i>
Mar. 18	H. W. Humphrey.....	1.08	63.8	May 26	H. W. Humphrey.....	4.44	868
18	do.....	1.08	66.4	June 8	do.....	4.30	811
20	do.....	1.48	168	19	do.....	4.60	905
25	do.....	2.23	270	July 3	do.....	4.68	926
30	do.....	2.43	317	13	do.....	4.72	973
Apr. 1	do.....	2.68	372	27	J. S. Moore.....	4.75	928
6	do.....	3.10	480	Aug. 6	H. W. Humphrey.....	4.82	948
11	do.....	3.21	511	17	Humphrey and Bates..	4.89	956
16	do.....	3.62	617	28	H. W. Humphrey.....	4.54	835
21	do.....	4.10	771	Sept. 14	do.....	3.85	651
May 4	do.....	4.29	833	24	do.....	3.46	541
13	do.....	4.46	870				

Daily discharge, in second-feet, of Sunnyside canal near Wapato, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	582	93	.....	375	806	806	921	935	513
2.....	569	31	.....	375	829	802	921	932	717
3.....	561	31	.....	415	835	796	921	956	796
4.....	548	31	.....	464	832	806	928	952	786
5.....	548	31	.....	482	835	812	932	960	773
6.....	535	31	.....	484	835	812	928	963	786
7.....	506	31	.....	482	852	809	935	988	770
8.....	511	35	.....	482	869	809	932	977	752
9.....	493	35	.....	489	880	809	953	980	745
10.....	476	35	.....	508	886	812	967	967	708
11.....	450	68	.....	510	886	825	963	956	690
12.....	424	68	.....	521	886	846	963	967	675
13.....	414	45	.....	543	890	842	949	967	669
14.....	402	45	.....	574	826	842	935	960	652
15.....	404	45	0	605	883	842	924	956	620
16.....	400	39	40	629	866	852	924	949	608
17.....	400	33	62	666	886	886	924	949	597
18.....	400	33	62	721	880	907	924	939	585
19.....	395	33	62	758	883	907	921	928	582
20.....	395	33	105	770	880	914	918	924	568
21.....	395	33	105	770	876	918	918	904	563
22.....	395	68	270	770	876	918	910	880	563
23.....	392	68	270	770	876	918	907	883	552
24.....	374	68	270	767	869	921	893	883	543
25.....	374	68	270	770	866	921	880	866	535
26.....	372	52	270	789	866	921	910	859	527
27.....	365	52	270	802	863	918	907	839	516
28.....	356	52	270	802	846	921	914	839	510
29.....	349	.....	320	802	819	921	914	832	508
30.....	333	.....	320	802	799	918	918	186	508
31.....	324	.....	375	.....	802	.....	932	646	.....

NOTE.—Discharge determined by indirect method for shifting channels.

Monthly discharge of Sunnyside canal near Wapato, for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October.....	582	324	434	26,700
November 1-28.....	93	31	46.0	2,550
March 15-31.....	270	0	209	6,630
April.....	802	375	623	37,100
May.....	890	799	860	52,900
June.....	921	796	864	51,400
July.....	967	880	925	56,900
August.....	988	186	894	55,000
September.....	796	508	631	37,500

TOPPENISH CREEK NEAR FORT SIMCOE, WASH.

LOCATION.—In sec. 26, T. 10 N., R. 16 E., at Olney's ranch, about $1\frac{1}{2}$ miles below the Fort Simcoe-Goldendale highway bridge, $3\frac{1}{2}$ miles southeast of Fort Simcoe, and about 8 miles southwest of White Swan.

DRAINAGE AREA.—124 square miles (revised measurement).

RECORDS AVAILABLE.—February 27, 1909, to September 30, 1914; fragmentary.

GAGE.—Vertical staff spiked to cottonwood tree on right bank one-half mile east of Olney's house, since July 23, 1913; prior to that date chain gage one-fourth mile farther upstream.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Gravel and cobblestones; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, determined by leveling from high-water marks of January 6, 5.9 feet (discharge, 1,000 second-feet) minimum stage recorded, 1.22 feet at 3.15 p. m. August 14 (discharge, 10.8 second-feet).

1909-1914: maximum stage recorded, 5.21 feet March 3, 1910 (discharge, 1,190 second-feet); minimum stage recorded, 1.22 feet at 3.15 p. m. August 14, 1914 (discharge, 10.8 second-feet).

WINTER FLOW.—Floating ice in creek occasionally; discharge relation probably not affected.

DIVERSIONS.—A small irrigating ditch diverts some water above the station.

REGULATION.—None at present. Diversion of spring run-off into a reservoir on Simcoe Creek for use in irrigating Indian lands is proposed.

ACCURACY.—Results fair.

Discharge measurements of Toppenish Creek near Fort Simcoe, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis- charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 24	Storey and Collier.....	3.55	401
Aug. 7	I. L. Collier.....	1.31	14.9
10	do.....	1.32	14.6

Daily discharge, in second-feet, of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	17.6	23	34	29	164	260	222	411	116	43	16.5	11.6
2	17.6	23	31	29	156	322	204	411	108	43	15.0	11.6
3	17.6	23	28	29	156	280	240	459	108	43	15.0	11.6
4	17.8	23	28	30	142	240	260	435	108	43	15.0	11.5
5	18.0	23	28	515	142	240	240	435	100	43	14.0	11.4
6	20.0	23	27	1,000	137	240	300	411	108	38	13.2	11.3
7	23.0	23	27	926	132	222	322	411	124	38	14.5	11.2
8	23.0	23	27	670	128	280	366	387	116	33	13.6	10.9
9	21.5	23	27	414	121	366	462	363	108	33	14.5	10.9
10	20.5	23	27	280	121	322	510	267	93	33	15.0	10.9
11	20.5	23	27	260	128	280	536	267	86	33	14.0	11.2
12	21.0	23	26	240	121	280	640	267	86	33	13.2	13.0
13	22.0	23	28	204	121	280	666	267	86	33	13.2	14.5
14	22.0	23	28	204	128	260	718	267	86	33	10.8	14.2
15	22.0	23	28	188	121	390	770	267	79	29	11.2	15.4
16	22.0	23	28	188	121	414	718	267	66	29	11.6	17.5
17	19.5	24	28	156	121	462	666	267	66	25	13.6	24.0
18	20.0	33	28	156	121	510	562	243	66	25	14.0	24.0
19	20.0	31	28	172	121	486	562	232	66	22	13.2	24.0
20	21.5	27	27	156	121	486	536	221	66	22	13.2	23.6
21	21.5	26	27	188	156	510	510	199	66	22	13.2	22.8
22	21.5	26	28	280	180	414	459	199	66	22	13.2	21.4
23	21.0	27	28	240	188	390	459	189	66	22	12.8	21.1
24	21.5	27	28	172	188	414	459	179	72	22	12.8	20.5
25	21.5	27	28	204	222	390	437	179	66	22	12.0	19.6
26	22.0	27	28	222	204	344	411	169	66	22	11.6	20.2
27	22.0	34	28	188	222	280	435	159	72	22	12.0	27.0
28	22.5	34	27	180	260	280	411	159	54	20	11.6	25.0
29	23.0	36	27	164	.....	280	387	150	54	19	11.6	23.6
30	22.5	34	29	172	.....	240	399	141	48	17	11.6	22.0
31	23.0	.....	35	164	.....	231	.....	124	.....	10.5	11.6	.....

NOTE.—Discharge determined by indirect method for shifting channels. Discharge interpolated, owing to lack of gage readings, Oct. 4; Nov. 25; Dec. 19, 20; Jan. 5 and 8; Feb. 6 and 7; July 11; Sept. 3, 4, 5, and 6.

Monthly discharge of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October	23	17.6	20.9	1,290	B.
November	36	23	26.0	1,540	B.
December	35	26	28.2	1,730	B.
January	1,000	29	259	15,300	B.
February	260	121	152	8,400	B.
March	510	222	335	20,600	B.
April	770	204	462	27,500	C.
May	459	124	271	16,700	B.
June	124	48	82.4	4,900	B.
July	43	16.5	29.0	1,780	B.
August	16.5	10.8	13.2	812	C.
September	27	10.9	17.2	1,020	C.
The year	1,000	10.8	141	102,000	

SIMCOE CREEK NEAR FORT SIMCOE, WASH.

LOCATION.—In sec. 34, T. 11 N., R. 16 E., just above Spring Creek, at a proposed reservoir site 4 miles northeast of Fort Simcoe.

DRAINAGE AREA.—77 square miles, revised value.

RECORDS AVAILABLE.—February 28, 1909, to September 30, 1914.

GAGE.—Vertical staff since March 24, 1910. Prior to that a chain gage at same location.

DISCHARGE MEASUREMENTS.—Made from a foot-log or by wading near the gage.

CHANNEL AND CONTROL.—Sand and gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.4 feet at 9 a. m.

January 7, 1914 (discharge, 462 second-feet); minimum stage recorded, 0.88 foot at 8 a. m. August 5, 1914 (discharge, 0.1 second-foot).

1909-1914: Maximum stage recorded, 6.5 feet March 2, 1910 (discharge, 1,340 second-feet); minimum stage recorded, 0.9 foot September 13-October 10, 1909 (discharge, zero).

WINTER FLOW.—Discharge relation not seriously affected by ice.

ACCURACY.—Results only fair because of lack of daily gage heights and shifting stream bed.

Discharge measurements of Simcoe Creek near Fort Simcoe, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
Mar. 24	Storey and Collier	<i>Feet.</i> 2.68	<i>Sec.-ft.</i> 108
Aug. 10	I. L. Collier	1.10	0.8

Daily discharge, in second-feet, of Simcoe Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	8	3	7	5	140	212	64	89	4	1.1	0.3	0.3
2.....	10	3	6	5	134	196	61	93	5	1.1	.2	.3
3.....	12	3	6	5	128	179	58	97	6	.9	.2	.3
4.....	15	3	5	5	122	162	55	91	6	.8	.1	.3
5.....	18	4	5	210	116	145	50	85	6	.7	.1	.3
6.....	16	4	4	414	110	129	69	79	6	.6	.3	.3
7.....	14	4	4	462	80	113	88	74	6	.6	.4	.4
8.....	12	4	4	390	50	97	106	62	6	.5	.5	.5
9.....	10	4	4	339	19	88	124	50	6	.5	.6	.6
10.....	8	4	4	288	14	79	140	38	6	.4	.8	.7
11.....	7	4	4	237	10	70	157	34	5	.4	.8	.8
12.....	7	4	4	186	6	62	174	31	5	.4	.7	.8
13.....	6	4	4	135	2	54	156	28	4	.5	.7	.9
14.....	6	4	4	85	4	46	175	25	4	.5	.6	.9
15.....	5	4	4	73	6	40	194	22	4	.6	.6	1.0
16.....	5	4	4	61	9	69	213	16	3	.6	.6	1.1
17.....	5	4	4	49	12	98	232	11	3	.4	.6	1.1
18.....	4	4	5	38	15	127	212	6	2	.3	.7	1.2
19.....	4	4	5	32	68	156	192	7	2	.3	.7	1.2
20.....	4	5	5	25	121	274	179	8	2	.3	.7	1.2
21.....	4	5	5	68	174	215	166	9	2	.3	.8	1.2
22.....	4	5	5	110	124	156	153	11	2	.4	.8	1.1
23.....	3	5	5	64	145	133	140	12	2	.4	.8	1.1
24.....	3	5	5	90	166	110	128	13	2	.4	.7	1.1
25.....	3	5	5	115	187	98	116	11	2	.4	.7	1.0
26.....	3	6	5	140	208	86	104	9	2	.4	.7	1.0
27.....	3	6	5	126	230	75	99	7	2	.4	.6	1.0
28.....	3	7	5	112	252	64	94	5	2	.4	.6	1.0
29.....	3	7	5	98	.....	64	89	4	2	.4	.5	1.0
30.....	3	8	5	85	.....	64	85	3	2	.4	.5	1.0
31.....	3	.....	5	60	.....	64	.....	3	.....	.4	.4	.....

NOTE.—Discharge determined as follows: Oct. 1 to Jan. 7, from a rating curve fairly well defined between 10 and 40 second-feet; Jan. 8 to Sept. 30, from a rating curve well defined between 10 and 150 second-feet. Gage read only at infrequent intervals, and discharge interpolated for intervening periods except June 24 to July 1, which has been estimated from hydrographic comparison with Satus and Toppenish creeks.

Monthly discharge of Simcoe Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
October.....	18	3	6.81	419	D.
November.....	8	3	4.53	270	D.
December.....	7	4	4.74	291	D.
January.....	462	5	133	8,180	C.
February.....	252	2	94.7	5,280	B.
March.....	274	40	114	7,010	B.
April.....	232	50	129	7,680	B.
May.....	97	3	33.3	2,050	C.
June.....	6	2	3.70	220	D.
July.....	1.1	0.3	0.51	31.4	D.
August.....	0.8	0.1	.56	34.4	D.
September.....	1.2	0.3	.82	48.8	D.
The year.....	462	0.1	43.4	31,500	

RESERVATION DRAIN AT ALFALFA, WASH.

LOCATION.—In sec. 29, T. 10 N., 21 E., at the highway bridge on the Toppenish-Mabton road, one-fourth mile southeast of Alfalfa station on the Northern Pacific Railway, about 2 miles above the mouth of drain.

RECORDS AVAILABLE.—December 5, 1912, to September 30, 1914; miscellaneous measurements 1911 and 1912.

GAGE.—Vertical staff on right bank under highway bridge.

DISCHARGE MEASUREMENTS.—Made from footbridge just above highway bridge at mouth of drain, 2 miles below gage.

CHANNEL AND CONTROL.—Composed of gravel; shifts slightly; current swift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.58 feet May 23 and 26 (discharge, 250 second-feet); minimum stage recorded, 1.20 feet August 3-4, 7-12 (discharge, 164 second-feet).

1913-1914: Maximum stage recorded, 1.65 feet May 9 and 11, 1913 (discharge, 264 second-feet); minimum stage recorded, 1.08 feet at 8 a. m. April 9, 1913 (discharge, 155 second-feet).

WINTER FLOW.—Ice does not form at this station.

ACCURACY.—Gage heights may be affected by backwater from Yakima River when the river is at a high stage. Gage height record not entirely reliable.

COOPERATION.—Station maintained in cooperation with United States Indian Office.

The discharge includes the return water from irrigation by the reservation canals and the underflow of Toppenish Valley. During the low-water period practically the whole flow of Toppenish Creek is carried into this canal by underground seepage.

Discharge measurements of Reservation drain at Alfalfa, Wash., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Dis-charge.	Date.	Made by—	Gage height.	Dis-charge.
		<i>Feet.</i>	<i>Sec.-ft.</i>			<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 2	E. F. Winston	1.30	197	June 6	R. S. Skillin	1.40	205
22	do.	1.45	221	13	do.	1.38	197
Nov. 1	do.	1.36	209	20	do.	1.37	195
14	F. B. Storey	1.29	179	27	do.	1.41	201
15	E. F. Winston	1.30	196	July 3	do.	1.34	191
Dec. 2	do.	1.27	195	10	do.	1.37	198
15	do.	1.24	188	18	do.	1.38	197
Jan. 3	do.	1.26	197	25	do.	1.30	183
16	do.	1.38	217	Aug. 1	do.	1.24	178
Feb. 2	R. S. Skillin	1.44	221	7	do.	1.21	168
14	do.	1.35	204	13	I. L. Collier	1.22	158
Mar. 4	do.	1.33	207	13	do.	1.22	160
20	I. L. Collier	1.26	199	14	R. S. Skillin	1.24	175
20	F. B. Storey	1.26	189	29	do.	1.30	183
Apr. 4	R. S. Skillin	1.30	199	Sept. 5	do.	1.37	199
May 4	do.	1.34	210	12	do.	1.37	198
16	do.	1.45	225	19	do.	1.41	205
25	I. L. Collier	1.50	227	26	do.	1.46	213
June 2	R. S. Skillin	1.42	208				

Daily discharge, in second-feet, of Reservation drain at Alfalfa, Wash., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	199	226	190	195	214	230	195	204	219	203	175	183
2	210	244	191	195	216	230	195	204	213	203	179	199
3	210	244	191	191	214	230	191	204	219	195	164	199
4	210	244	191	190	230	214	193	206	219	199	164	203
5	210	244	191	195	230	230	195	204	203	199	174	199
6	214	244	191	210	230	230	195	204	205	199	174	203
7	234	244	191	210	230	230	186	210	199	203	164	203
8	234	244	191	210	230	230	177	204	203	199	164	213
9	234	244	191	214	230	230	177	210	219	199	164	207
10	234	244	191	214	230	230	177	204	223	199	164	203
11	234	244	191	214	230	230	177	210	203	199	164	203
12	234	214	191	214	230	230	191	210	203	201	164	199
13	234	214	191	214	230	230	210	210	201	203	166	203
14	234	203	191	214	218	230	204	214	203	203	172	203
15	234	203	188	214	230	230	195	230	203	203	179	199
16	244	210	191	212	230	230	195	226	203	203	174	203
17	244	210	191	214	230	230	195	230	203	203	174	203
18	244	195	191	214	230	214	195	234	203	201	174	203
19	244	195	191	214	230	195	210	234	199	203	179	203
20	244	195	191	214	230	186	214	232	203	199	179	207
21	234	195	191	214	230	191	214	224	203	203	179	213
22	244	195	191	214	230	195	214	244	203	203	179	219
23	244	195	195	214	230	195	214	250	203	193	179	213
24	244	195	195	214	230	195	214	244	203	193	179	213
25	244	195	195	214	230	210	195	234	219	183	183	213
26	244	195	195	214	230	195	210	250	213	183	187	215
27	244	195	195	214	230	195	214	219	203	179	187	219
28	244	191	195	214	230	195	210	219	203	183	187	223
29	244	191	195	214	.....	210	210	219	203	179	185	223
30	244	191	195	214	.....	210	210	219	203	179	187	223
31	244	.....	195	214	.....	195	.....	219	.....	179	183	.....

NOTE.—Discharge determined as follows: Oct. 1 to May 26, from a rating curve well defined between 140 and 240 second-feet; May 27 to September 30 from a rating curve well defined between 160 and 240 second-feet. Discharge interpolated, owing to lack of gage reading, July 12.

Monthly discharge of Satus Creek below Dry Creek, near Toppenish, Wash., for the period June 22 to Sept. 30, 1913, and the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu- racy.
	Maximum.	Minimum.	Mean.		
1913.					
June 22-30.....	101	73	87.1	1,550	C.
July.....	69	22	36.9	2,270	D.
August.....	22	13	15.8	972	D.
September.....	22	12.6	14.8	881	D.
The period.....				5,670	
1914.					
October.....	23.5	15.0	19.1	1,170	A.
November.....	39.2	23.5	28.2	1,680	B.
December.....	37.6	29.4	31.6	1,940	A.
January.....	84.4	35.2	300	18,400	B.
February.....	818	90.0	226	12,600	A.
March.....	882	204	448	27,500	A.
April.....	472	182	264	15,700	B.
May.....	220	102	168	10,300	A.
June.....	98	28.5	57.7	3,430	A.
July.....	27.7	12.3	18.4	1,130	B.
August.....	11.8	8.0	9.51	585	B.
September.....	14.0	9.4	11.4	678	B.
The year.....	882	8.0	131	95,100	

MISCELLANEOUS MEASUREMENTS.

The following miscellaneous discharge measurements are arranged in the same order of drainage basins as the regular stations.

Miscellaneous discharge measurements in drainage basins in Washington for the year ending Sept. 30, 1914.

Stilaguamish River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Dis-charge.
Oct. 28	Canyon Creek.....	South Fork Stilaguamish River.	Mouth near Granite Falls, Wash.	<i>Feet.</i> 1.09	<i>Sec.-ft.</i> 140

Sauk River basin.

Oct. 26	Sauk River.....	Skagit River.....	Above Clear Creek.....	<i>a</i> 1.42	1,300
May 12	do.....	do.....	do.....	<i>b</i> 1.98	2,490
Oct. 24	Clear Creek.....	Sauk River.....	At mouth.....	<i>c</i> 2.06	149
May 12	do.....	do.....	do.....	<i>d</i> 2.58	265
Nov. 19-21	Columbia River.....	Pacific Ocean.....	Northern Pacific Ry. bridge near Pasco, Wash.	.46	61,200

a New gage read 2.52 feet.
b New gage read 3.43 feet.

c New gage read 1.92 feet.
d New gage reading.

Miscellaneous discharge measurements in drainage basins in Washington for the year ending Sept. 30, 1914—Continued.

Clark Fork drainage basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
Feb. 11	Clark Fork River.....	Columbia River.....	Newport, Wash.....	<i>Feet.</i> a b 0.67	<i>Sec.-ft.</i> 10,100
June 11	do.....	do.....	do.....	a 13.00	67,500
Jan. 18	Inland Portland Cement Co.'s flume.	Sullivan Creek.....	One-half mile below intake.	1.95	64.4
June 12	do.....	do.....	do.....	1.94	68.1
Aug. 16	Little Blackfoot ditch.	Little Blackfoot River.	In the SE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 30, T. 9 N., R. 6 W.	.33	.05

Kettle River drainage basin.

Nov. 3	Sherwood Creek.....	Kettle River.....	Bridge near Boyds, Wash., One-fourth mile above mouth.	.....	11.2
Jan. 14	do.....	do.....	do.....	(c)	10.1
Feb. 6	do.....	do.....	do.....	.....	d 6.8

Barnaby Creek drainage basin.

Apr. 26	Barnaby Creek.....	Columbia River.....	1½ miles north of Mission, Wash.	89.1
---------	--------------------	---------------------	----------------------------------	-------	------

Spokane River drainage basin.

Sept. 29	Spokane River.....	Columbia River.....	At Trent, Wash.....	19.44	1,510
Jan. 11	North Fork St. Joe River.	St. Joe River.....	One-fourth mile above highway bridge near Avery, Wash.	(e)	194
Mar. 6	North Fork Coeur d'Alene River.	Coeur d'Alene River..	Enaville, Idaho.....	5.15	2,030
15	Little North Fork Coeur d'Alene River.	North Fork Coeur d'Alene River.	Cannings' ranch near Enaville, Idaho.	9.5	489
June 9	Placer Creek.....	South Fork Coeur d'Alene River.	Wallace, Idaho.....	5.05	146
18	Latah Creek.....	Spokane River.....	Tekoa, Wash.....	.71	2.4
18	North Fork Latah Creek.	Latah Creek.....	Mouth.....	.19	0.3

Nespelem River basin.

Feb. 20 ^a	Little Nespelem River.	Nespelem River.....	Three-fourths mile south of the agency, at highway bridge.	0.47	13.6
21 ^b	do.....	do.....	do.....	4.4	186.1
22 ^b	do.....	do.....	do.....	3.36	161.2
Apr. 18 ^c	do.....	do.....	do.....	3.05	159.9
20 ^d	do.....	do.....	do.....	.....	143.5
Aug. 30	do.....	do.....	do.....	.0	1.05
Feb. 19 ^e	Owhi Lake.....	Little Nespelem River	Lake Owhi.....	.33	1.0
Apr. 17 ^f	do.....	do.....	do.....	1.6	31.4
Aug. 30	do.....	do.....	do.....	.2	.0

^a Discharge measurement made at Mataline Falls, 50 miles downstream.

^b Discharge relation affected by ice.

^c 2.85 feet below reference point; lower edge of first log beyond abutment of left downstream side of highway bridge.

^d Considerable ice in creek; probably minimum flow for winter.

^e 1.9 feet below reference point. Top edge of downstream end of seventh log from top on stream side of right abutment of highway bridge.

^f This amount includes 8.1 second-feet carried by a diverting flume.

^g Estimated.

^h Data furnished by courtesy of L. M. Holt, superintendent U. S. Indian Service.

ⁱ Wading measurement.

^j Measured from highway bridge.

Miscellaneous discharge measurements in drainage basins in Washington for the year ending Sept. 30, 1914—Continued.

Okanogan River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
Sept. 10	Okanogan River.....	Columbia River.....	200 feet above highway bridge, at Oroville, Wash.	<i>Feet.</i>	<i>Sec.-ft.</i> 550

Methow River basin.

Oct. 2	Chewack Creek.....	Methow River.....	Winthrop, Wash.....	1.07	76.5
2	Fulton canal.....	Chewack Creek.....	Above controlling spill.....		14.9
3	Twisp River.....	Methow River.....	Twisp, Wash.....	.76	50.1

Wenatchee River basin.

Aug. 15	Wenatchee Park Land & Irrigation Co. canal.	Chiwawa Creek.....	Near intake 17 miles from Leavenworth, Wash.	.....	9.18
Sept. 23	Icicle canal.....	Right bank of Icicle Creek.	Opposite regular station on Icicle Creek.	.....	7.6
25	South Branch Icicle canal.	Icicle Canal.....	Near Peshastin siphon.....		3.8
25	Peshastin Creek.....	Wenatchee River.....	1½ miles above mouth, near Peshastin, Wash.	(a)	16.9
23	Cascade Irrigation Co. canal.	Left bank, Icicle Creek	100 feet below intake.....		7.3
25	Beecher canal.....	Peshastin Creek.....	At head of siphon across Peshastin Valley.		.4
25	Peshastin canal.....	Right bank, 3½ miles above mouth of Peshastin Creek.	Peshastin, Wash.....		8.1
25	Otis ditch.....	Right bank, 2½ miles above mouth.	.....do.....		2.3
25	Union ditch.....	Right bank of Peshastin Creek.	1½ miles below intake, Peshastin, Wash.		.2
25	Gibbs ditch.....	Left bank Peshastin Creek, 2½ miles from mouth.	Peshastin, Wash.....		1.8

Yakima River basin.

Aug. 6	Small diversion ditch..	Right bank South Fork Atanum Creek.	Near gaging station at Shanafelt's ranch.	.....	1.1
10	.....do.....	Soda Springs Creek...	Near new gaging station on Simcoe Creek.	.....	2.1
10	Samson's ditch.....	Tsapas Creek.....	.....do.....	.....	.4
10	Nichol's ditch.....	Toppenish Creek.....	Near new gaging station on Toppenish Creek.	.....	2.5
June 17	Satus Creek.....	Yakima River.....	200 feet below Shearer dam.	(b)	28.5
28	.....do.....	.....do.....	.....do.....	(c)	31.1
July 18	.....do.....	.....do.....	.....do.....	(d)	13.0
Mar. 24	Spring Creek.....	Simcoe Creek.....	Mouth one-fourth mile below Simcoe Creek gage.	(e)	2.0
June 5	Shearer ditch.....	Satus Creek.....	200 feet below intake.....	.....	18.4

a Measured below all diversions.

b 11.4 second-feet, carried by Shearer ditch, measured and included.

c 15.9 second-feet, carried by Shearer ditch, measured and included.

d 7.6 second feet, carried by Shearer ditch, measured and included.

e Estimated.

INDEX.

A.	Page.
Accuracy, degree of.....	13-14
Acknowledgments to those aiding.....	14-15
Acre-foot, definition of.....	8
Agency Creek near Jocko, Mont.....	87-89
Alfalfa, Wash., Reservation drain near.....	190-192
American River near Nile, Wash.....	172-173
Anaconda, Mont., Racetrack Creek near.....	54-55
Anderson's ranch, Wash., Naches River at.....	166-167
Appropriations, table of.....	7
Ashford, Wash., Nisqually River near.....	17-18
Atanum Creek, North Fork, near Tampico, Wash.....	170-180
Atanum Creek, South Fork, near Tampico, Wash.....	180-182
Authority for work.....	7
Avery, Idaho, St. Joe River at and near.....	114-115, 195
B.	
Baker Lake near Concrete, Wash.....	37-38
Baker River at and near Concrete, Wash.....	38-40
Barnaby Creek near Mission, Wash.....	195
Beecher Canal in Peshastin Valley, Wash.....	196
Bellingham, Wash., Whatcom Creek near.....	42-43
Whatcom Lake near.....	42
Belton, Mont., Middle Fork of Flathead River at.....	65-66
Berlin, Wash., Miller Creek near.....	25-26
Big Knife Creek near Jocko, Mont.....	86-87
Bitterroot River, East Fork, near Darby, Mont.....	57-58
Bitterroot River, West Fork, near Darby, Mont.....	56-57
Boysd, Wash., Kettle River at.....	102-103
Sherwood Creek near.....	195
Brown, C. O., work of.....	15
Buckley, Wash., White River at.....	20-22
White River flume at.....	22-23
Bumping Lake near Nile, Wash.....	170
Bumping River near Nile, Wash.....	170-172
C.	
Callahasa Creek at Troy, Mont.....	45-46
Calland, R. R., work of.....	15
Canyon Creek near Granite Falls, Wash.....	194
Cascade Irrigation Co.'s canal near intake, Wash.....	196
Chelan, Wash., Chelan River at.....	128-129
Lake Chelan at.....	127-128
Chewack Creek at Winthrop, Wash.....	196
Chiwaukum, Wash., White River near.....	135-136
Chiwawa Creek near Leavenworth, Wash.....	136-137
Clark Fork at Metaline Falls, Wash.....	53-54
at Newport, Wash.....	195
at St. Regis, Mont.....	49-50
near Plains, Mont.....	50-51

	Page.
Clark Fork basin, stream flow in.....	49-54, 195
Clear Creek at and near mouth, Wash.....	194
Cle Elum, Wash., Leanaway River near.....	163-164
Yakima River at.....	146-148
Cle Elum Lake near Roslyn, Wash.....	161
Cle Elum River near Roslyn, Wash.....	161-163
Coeur d'Alene Lake at Coeur d'Alene, Idaho.....	108
Coeur d'Alene River, North Fork, at Ena-ville, Idaho.....	195
at Prichard, Idaho.....	106-107
Collier, I. L., work of.....	15
Columbia Falls, Mont., North Fork of Flat-head River near.....	62-63
South Fork of Flathead River near.....	67-68
Columbia River, near Pasco, Wash.....	194
Columbia River basin, stream flow in.....	44-194
Completed results, accuracy of.....	13-14
Conconully, Wash., Salmon Creek near.....	122-124
Concrete, Wash., Baker Lake near.....	37-38
Baker River at and near.....	38-41
Control, definition of.....	89
Coolin, Idaho, Priest River at.....	97-99
Cooperation, details of.....	14-15
Crow Creek at Lozeau's ranch, Mont.....	72-74
near Ronan, Mont.....	71-74
Current meters, views of.....	12
D.	
Darby, Mont., East Fork of Bitterroot River near.....	57-58
West Fork of Bitterroot River near.....	56-57
Data, accuracy of.....	13
explanation of.....	11-13
Definitions.....	8-9
Discharge, conversion of.....	9-10
tables of.....	12-13
Discharge relation, definition of.....	8
Dixon, Mont., Revais Creek near.....	94-95
Dry Creek near St. Ignatius, Mont.....	76
Dryden, Wash., Wenatchee River at.....	133-135
Wenatchee Valley canal at.....	139-140
E.	
East Finley Creek near Jocko, Mont.....	90-92
Easton, Wash., Kachess Lake near.....	158
Kachess River near.....	159-160
Yakima River at.....	144-146
Electron, Wash., Puyallup River near.....	18-20
Ellensburg, Wash., Manastash Creek near.....	164-166
Elliston, Mont., Little Blackfoot River near.....	55-56
Enaville, Idaho, Little North Fork of Coeur d'Alene River near.....	195
North Fork of Coeur d'Alene River at.....	195
Entiat River at Entiat, Wash.....	129-131
Equivalents, table of.....	9-11

F.		L.	
	Page.		Page.
Falls Creek near Jocko, Mont.....	84-86	Lake Chelan at Chelan, Wash.....	127-128
Field data, accuracy of.....	13	Lake McDonald Lake outlet at Lake McDon-	
Finley Creek near Jocko, Mont.....	89-90	ald, Mont.	66-67
Flathead Lake at Polson, Mont.....	63	Lamb, W. A., work of.....	15
Flathead River near Polson, Mont.....	64-65	Latah Creek at Tekoa, Wash.....	195
Flathead River, Middle Fork, at Belton,		Latah Creek, North Fork, at mouth, Wash..	195
Mont.....	65-66	Leavenworth, Wash., Chiwawa Creek near.	136-137
Flathead River, North Fork, near Columbia		Icicle Creek near.....	138-139
Falls, Mont.....	62-63	Wenatchee Park Land & Irr. Co.....	196
Flathead River, South Fork, near Columbia		Wenatchee River near.....	131-132
Falls, Mont.....	67-68	Libby, Mont., Kootenai River at.....	44-45
Fort Simcoe, Wash., Simcoe Creek near...	188-190	Little Bitterroot River near Hubbard, Mont..	69-71
Toppenish Creek near.....	187-188	near Marion, Mont.....	68-69
Fulton canal near spill, Wash.....	196	Little Blackfoot ditch, Mont.....	195
G.		Little Blackfoot River near Elliston, Mont..	55-56
Gaging stations, distribution of.....	7-8	Little Falls, Wash., Spokane River below..	112-114
records at.....	12	Little Nespelem River near agency, Wash..	195
view of.....	12	Little North Fork Coeur d'Alene River near..	195
Gibbs ditch at Peshastin, Wash.....	196	Lolo Creek near Lolo, Mont.....	59-60
Granite Falls, Wash., Canyon Creek near...	194	Longlake, Wash., Spokane River near.....	112-114
South Fork of Stlilagamish River at....	29-31	Lozeau's ranch, Mont., Crow Creek at.....	72-74
H.		M.	
Hall Creek near Inchelium, Wash.....	103-105	McAllister Meadows, Wash., Tieton River	
Hartson, J. T., work of.....	15	at.....	175-176
Hubbart, Mont., Little Bitterroot River		Manastash Creek near Ellensburg, Wash....	164-166
near.....	69-71	Marblemount, Wash., Skagit River near....	31-34
Humphrey, H. W., work of.....	15	Stettatle Creek near.....	36-37
I.		Marion, Mont., Little Bitterroot River near...	68-69
Icicle canal near Icicle Creek, Wash.....	196	Martin, Wash., Keechelus Lake near.....	142
near Peshastin, Wash.....	196	Yakima River near.....	142-144
Icicle Creek near Leavenworth, Wash.....	138-139	Metaline Falls, Wash., Clark Fork at.....	53-54
Idaho, cooperation of.....	14	Sullivan Creek near.....	100-102
Inchelium, Wash., Hall Creek near.....	103-105	Sullivan Lake near.....	99-100
Stranger Creek near.....	105-106	Methow River at Peteros, Wash.....	124-125
Index, Wash., North Fork of Skyhomish		Methow River basin, Wash., stream flow	
River near.....	26-28	in'.....	124-125, 196
South Fork of Skyhomish River near....	23-25	Miller Creek near Berlin, Wash.....	25-26
Indian ditch near Jocko, Mont.....	92-93	Miner's inch, equivalents of.....	10-11
Inland Portland Cement Co.'s flume, Wash..	195	Mission, Wash., Barnaby Creek near.....	195
J.		Mission Creek near St. Ignatius, Mont.....	74-75
Jocko, Mont., Agency Creek near.....	87-89	Montana, cooperation of.....	14
Big Knife Creek near.....	86-87	Moses Lake at Neppel, Wash.....	140-141
East Finley Creek near.....	90-92	Moxley, T. E., work of.....	15
Falls Creek near.....	84-86	Moyie River at Snyder, Idaho.....	47-48
Finley Creek near.....	89-90	N.	
Indian ditch near.....	92-93	Naches, Wash., North Fork of Tieton River	
Jocko River near Jocko, Mont.....	80-81	near.....	173-175
Jocko River, Middle Fork, near Jocko, Mont.	81-83	Tieton Canal near.....	178-179
Jocko River, North Fork, near Jocko, Mont..	83-84	Tieton River near.....	175-176
Jocko River, South Fork, near Jocko, Mont..	78-80	Naches River at Anderson's ranch, Wash..	166-167
Jones, B. E., work of.....	15	at Oak Flat, Wash.....	168-169
K.		near Nile, Wash.....	166-169
Kaches Lake near Easton, Wash.....	158	Neppel, Wash., Moses Lake at.....	140-141
Kaches River near Easton, Wash.....	159-160	Nespelem River at Nespelem, Wash.....	118-119
Keechelus Lake near Martin, Wash.....	142	Nespelem River basin, Wash., stream flow	
Keller, Wash., Sanpoil River at.....	117-118	in.....	118-119, 195
Kettle River at Boyds, Wash.....	102-103	Newport, Wash., Clark Fork at.....	195
Kettle River basin, Wash., stream flow		Nile, Wash., American River near.....	172-173
in.....	102, 103, 195	Bumping Lake near.....	170
Kiona, Wash., Yakima River at.....	156-157	Bumping River near.....	170-172
Kootenai River at Libby, Mont.....	44-45	Naches River near.....	166-169
Kramer, E. W., work of.....	15	Nisqually River near Ashford, Wash.....	17-18
		O.	
		Oak Flat, Wash., Naches River near.....	168-169
		Okanogan River at Okanogan, Wash.....	119-121
		at Oroville, Wash.....	196

	Page.
Okanogan River basin, Wash., stream flow in.....	119-121, 196
Oroville, Wash., Okanogan River at.....	196
Similkameen River near.....	121-122
Otis ditch at Peshastin, Wash.....	196
Owhi Lake at outlet, Wash.....	195

P.

Parker, J. L., work of.....	15
Parker, Wash., Reservation canals near.....	182-185
Pasco, Wash., Columbia River near.....	194
Pateros, Wash., Methow River at.....	124-125
Pend Oreille Lake at Sandpoint, Idaho.....	52
Peshastin, Wash., canals at and near.....	196
Placer Creek at Wallace, Idaho.....	195
Plains, Mont., Clark Fork near.....	50-51
Polson, Mont., Flathead Lake at.....	63
Flathead River near.....	64-65
Post Creek near St. Ignatius, Mont.....	77-78
Post Falls, Idaho, Spokane River at.....	109-110
Spokane Valley Land & Water Co.'s canal at.....	115-116
Prichard, Idaho, North Fork of Coeur d'Alene River at.....	106-107
Priest River at Coolin, Idaho.....	97-99
at Priest Lake outlet, Idaho.....	97-99
Prospect Creek near Thompson Falls, Mont.....	96-97
Prosser, Wash., Yakima River near.....	154-155
Puget Sound basin, stream flow in.....	17-43
Puyallup River near Electron, Wash.....	18-20

Q.

Quinault River at Quinault, Wash.....	15-17
Quinault River basin, Wash., stream flow in.....	15-17

R.

Racetrack Creek near Anaconda, Mont.....	54-55
Rating table, explanation of.....	12
Ray, J. M., work of.....	15
Reflector Bar, Wash., Skagit River at.....	31-32
Revals Creek near Dixon, Mont.....	94-95
Reservation canals near Parker, Wash.....	182-185
Reservation drain near Alfalfa, Wash.....	190-192
Ronan, Mont., Crow Creek near.....	71-74
Roslyn, Wash., Cle Elum Lake near.....	161
Cle Elum River near.....	161-163
Run-off, definition of.....	8

S.

St. Ignatius, Mont., Dry Creek near.....	76
Mission Creek near.....	74-75
Post Creek near.....	77-78
St. Joe River at and near Avery, Idaho.....	114-115, 195
St. Regis, Mont., Clark Fork at.....	49-50
St. Regis River near.....	60-61
Salmon Creek near Conconully, Wash.....	122-124
Sandpoint, Idaho, Pend Oreille Lake at.....	52
Sanpoil River at Keller, Wash.....	117-118
Satus Creek near Shearer dam, Wash.....	196
near Toppenish, Wash.....	192-194
Sauk River near Clear Creek, Wash.....	194
Sauk River basin, Wash., stream flow in.....	194
Sedro Woolley, Wash., Skagit River near.....	34-36
Second-feet, definition of.....	8
Shearer ditch near intake, Wash.....	196
Sherwood Creek near Boyds, Wash.....	195
Silverton, Wash., South Fork of Stilaguamish River near.....	28-29

Simcoe Creek near Fort Simcoe, Wash.....	188-190
Similkameen River near Oroville, Wash.....	121-122
Skagit River at Reflector Bar, Wash.....	31-32
near Marblemount, Wash.....	33-34
near Sedro Woolley, Wash.....	34-36
Skyhomish River, North Fork, at Index, Wash.....	26-28
Skyhomish River, South Fork, near Index, Wash.....	23-25
Snyder, Idaho, Moyie River at.....	47-48
Spokane River at Post Falls, Idaho.....	109-110
at Spokane, Wash.....	110-112
at Trent, Wash.....	195
below Little Falls, Wash.....	112-114
near Long Lake, Wash.....	112-114
Spokane Valley Land & Water Co.'s canal at Post Falls, Idaho.....	115-116
Spokane River basin, Wash., stream flow in.....	106-116, 195
Spring Creek at mouth, Wash.....	196
Stehekin River at Stehekin, Wash.....	125-127
Stetattle Creek near Marblemount, Wash.....	36-37
Stevens, G. C., work of.....	15
Stewart, J. E., work of.....	15
Stilaguamish River, South Fork, at Granite Falls, Wash.....	29-31
near Silverton, Wash.....	28-29
Stilaguamish River basin, Wash., stream flow in.....	28-31, 194
Storey, F. P., work of.....	15
Stranger Creek near Inchelium, Wash.....	103-105
Sullivan Creek near Metaline Falls, Wash.....	100-102
Sullivan Lake near Metaline Falls, Wash.....	99-100
Sunnyside canal near Wapato, Wash.....	185-187

T.

Tampico, Wash., North Fork of Atanum Creek near.....	179-180
South Fork of Atanum Creek near.....	180-182
Taylor, Paul, work of.....	15
Teanaway River near Cle Elum, Wash.....	163-164
Tekoa, Wash., Latah Creek at.....	195
Terms, definition of.....	8-9
Thompson Falls, Mont., Prospect Creek near.....	96-97
Thompson River near.....	95-96
Tieton canal near Naches, Wash.....	178-179
Tieton River at McAllister Meadows, Wash.....	175-176
near Naches, Wash.....	175-177
Tieton River, North Fork, near Naches, Wash.....	173-175
Toppenish, Wash., Satus Creek near.....	192-194
Toppenish Creek near Fort Simcoe, Wash.....	187-188
Trent, Wash., Spokane River at.....	195
Troy, Mont., Callahan Creek at.....	45-46
Yaak River near.....	46-47
Tuttle, A. H., work of.....	15
Twisp River at Twisp, Wash.....	196

U.

Umtanum, Wash., Yakima River at.....	148-149
Union ditch at Peshastin, Wash.....	196
Union Gap, Wash., Yakima River at.....	150-151

W.

Wallace, Idaho, Placer Creek at.....	195
Wapato, Wash., Sunnyside canal near.....	185-187
Yakima River near.....	152-153
Washington, cooperation of.....	14

	Page.	Y.	Page.
Water power, calculation of.....	11	Yaak River near Troy, Mont.....	46-47
Water-stage recorders, views of.....	13	Yakima River at Cle Elum, Wash.....	146-148
Wenatchee Park Land & Irrigation Co. near Leavenworth, Wash.....	196	at Easton, Wash.....	144-146
Wenatchee River at Dryden, Wash.....	133-135	at Kiowa, Wash.....	156-157
near Leavenworth, Wash.....	131-132	at Umtanum, Wash.....	148-149
Wenatchee River basin, stream flow in.....	131-140, 196	at Union Gap, Wash.....	150-151
Wenatchee Valley canal at Dryden, Wash..	139-140	near Martin, Wash.....	142-144
Whatcom Creek near Bellingham, Wash....	42-43	near Prosser, Wash.....	154-155
Whatcom Lake near Bellingham, Wash.....	42	near Wapato, Wash.....	152-153
White River at Buckley, Wash.....	20-22	near Yakima, Wash.....	150-151
White River flume at Buckley, Wash.....	22-23	Yakima River basin, Wash., stream flow	9
near Chiwaukum, Wash.....	135-136	in.....	142-194, 196
Winthrop, Wash., Chewack Creek at.....	196	Z.	
Work, division of.....	15	Zero flow, definition of.....	9